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ACORN USER
APRIL 1993
£1.80
BE A MOVIE MAKER
From video to Replay file with the new DIY system
Three major new Acorn releases
PREVIEW
Acorn User's Spring show
ISSN 0263-7456
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SCSI systems The complete

CD ROM Systems

Our CD ROM systems comprise of a Toshiba mechanism (Multisession - Photo CD compatible), a Morley SCSI card, a set of stereo speakers and four collections of discs to choose from (see below). The software on these discs is all RISC OS software and requires no use of a PC emulator whatsoever.

Collection 1	£649.00
(Grooves, Creepy Crawlies, Image Warehouse)	
Collection 2	£729.00
(Grooves, Creepy Crawlies, Image Warehouse and Hutchinsons Encyclopedia)	
Collection 3	£769.00
(Grooves, Creepy Crawlies, Image Warehouse and Dictionary of the living world)	
Collection 4	£849.00
(Grooves, Creepy Crawlies, Image Warehouse, Hutchinsons Encyclopedia and Dictionary of the living world)	
CD ROM Drive & SCSI Interface	£489.00



Hard Disc Systems

The Morley Hard Disc systems comprise of a SCSI card together with all the necessary cables, SCSI management software, Hard Disc and a detailed manual. Effectively giving the user a 'plug in and go' solution to Hard Disc storage Many of our existing customers have commented about how easy it was to connect their Morley Hard Disc to their computer.

External Hard Discs are housed in an attractive metal case with dual SCSI connectors and device ID switch already fitted. As with all of our SCSI cards CDFS is installed as standard.

A3000 or External 40Mb	£349.00
A3000 or External 80Mb	£499.00
A3000 or External 240Mb	£709.00
A300/400/5000 Internal 40Mb	£269.00
A300/400/5000 Internal 80Mb	£449.00
A300/400/5000 Internal 240Mb	£699.00



Syquest Hard Discs

Our removable Cartridge Hard Disc systems are designed to offer the end user the ultimate in terms of portable, mass storage. The systems come in a choice of either 42Mb or 88Mb sizes (non interchangeable). With the benefit of a small on-board cache the mechanisms offer superb performance with transfer rates exceeding that of many standard fixed hard discs.

The biggest advantage of these systems is that when a cartridge is full, you simply have to insert a new cartridge and you have another full 42Mb or 88Mb to play with.

All systems

42Mb system	£499.00
88Mb system	£775.00

(Both include SCSI Interface & one cartridge)

Consumables

42Mb Cartridges	£65.00
88Mb Cartridges	£109.00



APRIL 1993

COVER: ROBERT CLIFFORD AND GEORGE SNOW

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Publisher Robert Marriott

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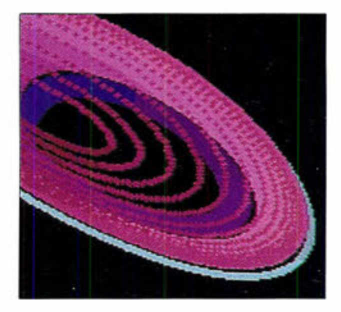
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SOFTWARE

Title	Publisher	Price
10 out of 10 Early Essentials	Triple R	£19
10 out of 10 English	Triple R	£19
10 out of 10 Maths (Number)	Triple R	£19
1st Word Plus	Acorn	£63
– extra copy of manual	Acorn	vo £10
3D Construction Kit (not OS 3.1)	Domark	£35
A3000 Technical Reference Manual	Acorn	vo £30
A4 Technical Reference Manual	Acorn	vo £65
A5000 Technical Reference Manual	Acorn	vo £65
A540 Technical Guide	Acorn	vo £65
Acheton / Kingdom of Hamil	Topologika	£17
Accounts	ACS	£245
Adventure Playground, age 5-8	Storm	£21
Aggressor	Atomic	£15
Air Supremacy	Superior	£17
Aldebaran	ArcAngels	£26
Alerion	Dabs	£12
Alien Invasion	Dabs	£12
All-In Boxing	Dabs	£12
Alpha-Base	Clares	£36
ALPS Adventure Language Programming System	Alpine	£28
Amazing Ollie, age 4+	Storm	£14
Ancestry	Minerva	£59
ANSI C Release 4 User Guide	Acorn	vo £25
Arcade 3 Compilation	Clares	£12
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ArcDFS	Dabs	£22
ArcFAX	David Pilling	£19
Arcendium	Dabs	£12
Archimedes Assembly Language	Dabs	vo £15
– with disc		£22
Archimedes First Steps	Dabs	vo £10
Archimedes Game Maker's Manual	Sigma	vo £15
Archimedes Operating System	Dabs	vo £15
– with disc		£22
Architech	ExpLAN	£165
Archway 2	Simtron	£78
ArcLight	Ace	£45
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Arcol Desktop	ExpLAN	£49
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ARCtist	Fourth Dim	£19
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Art Machine Pack 2	Topologika	£39
ArtWorks	CC	**£129**
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– site licence		£545
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Atelier	Minerva	£69
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Avon & Murdac	Topologika	£16
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BBC Basic Guide	Acorn	vo £21
Beginner's Guide to Wimp Programming on the Archimedes	Sigma	vo £13
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Blitz	Arxe	£17
BlowPipe	Leading Edge	£14
Bobby Blockhead vs The Dark Planet	Atomic	£15
Bookstore, age 7-16	ESM	£37
Break 147 & Superpool	Fourth Dim	£25

MARCH 1993

Title	Publisher	Price
Budget DTP	Dabs	vo £13
Bug Hunter / MoonDash	Minerva	£10
Bug Hunter in Space	Minerva	£10
Business Accounts	Minerva	£298
C (new edition)	Dabs	vo £16
– with disc		£24
CableNews	Lingenuity	£136
CADet	Minerva	£135
Cartoon Collection	Micro Studio	£16
Casino	Minerva	£11
Castle of Dreams, age 9+	Storm	£22
Cataclysm	Fourth Dim	£18
Caverns	Minerva	£10
C Development System	RISC	£77
Chameleon (new version)	4mation	£33
Champions Compilation	Krisalis	**£24**
Charts & Graphs	Computer Tutorial	£17
ChartWell	RISC	£25
Chatter	4mation	£34
Chequered Flag	CIS	£18
– Extra Circuits	CIS	£16
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– Compendium	Fourth Dim	£27
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Christmas Allsorts	Sherston	£15
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Clip Art	Graphics Factory	
– Vol 1 (General), sprites		£19
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Clip Art Set 1, drawfiles	Midnight	£28
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CNC Designer V3 for Lathe	TechSoft	£343
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– Arc/Mac Cable	Human	£24
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– site licence		£45
ColourSep Starter Packs	ICS	
– DeskJet 500 (Mono)		£55
– site licence		£85
– BJ-10 with Cartridges		£85
– site licence		£115
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– site licence		£70
Compression	CC	£34
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Concept Designer	Longman	£23
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Converta-Key	Triple R	£9
Cops	Alpine	£15
Corruption	Magnetic	£21
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Craftshop 2	4mation	£19
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DataGraph	Topologika	£29
Datapower	Iota	£145
DataVision	Silicon	£79
DataWord	Triple R	£15
DBEdit	4mation	£28
Decorated Alphabet, sprites	Micro Studio	£17
Designer V3	TechSoft	£193
Designer Intro (not OS 3)	TechSoft	£75
Designer's Graphics, draw/sprites	Micro Studio	£16
DeskEdit2	RISC	£27
Desktop Assembler Release 2	Acorn	£119
Desktop C Release 4	Acorn	**£180**
Desktop Database	Iota	£52
Desktop Folio	ESM	£60
– Themes: Christmas, Editors, Maths, Space, World War II	each	£22
Desktop Office v2	Minerva	£95
Desktop Publishing on the Archimedes	Sigma	vo £13
Desktop Thesaurus	RISC	£18
Detect-a-Pet, age 5-11	ESM	£49
DFS Reader	RISC	£9
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!Draw_Help	Sherston	vo £16
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Dreamwave	EMR	£34
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DTP Graphics 1 Mono, sprites	Micro Studio	£15
DTP Graphics 2 Colour	Micro Studio	£17
DTP Graphics combined	Micro Studio	£25
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– Christmas		£35
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Dungeon	Fourth Dim	£26
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– Dictionaries: Danish / Dutch / French / German / Italian / Norwegian / Spanish / Swedish / Swiss German /Welsh	each	£30
Ego: Repton 4	Superior	**£18**
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EluciData (OCR)	Irlam	£155
– bought with Irlam Scanner		£79
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Equasor	CC	£37
Ethnic Borders	4mation	£10
E-Type Compendium	Fourth Dim	£18
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Eureka	Longman	**£99**
ExcellonDrill	Silicon	£63
Express	Midnight	£45
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Farmer Giles II	Computer Tutorial	£17
Fervour	Clares	£19
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First Impression	Word Processing	vo £28
First Logo	Longman	**£24**
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Flare	Silica	£22
Flexifile	Minerva	£84
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Flight Sim Toolkit	Simis	£31
Fontasy	ICS	**£15**
– site licence		£45
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– site licence		£80
FontFX	Data Store	£9
– site licence		£70
Font Pack – Newhall, Starter, Symbol		
– each pack	Acorn	£35
Font Pack 1 – Paladin, Swiss B, Symbol B, Vogue	RISC	£47
Font Pack – Avant Garde, Bookman Pembroke – each pack	CC	£24
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Freddy's Folly (not OS 3)	Minerva	£8
Freddy Teddy	Topologika	£19
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– The Playground	Topologika	£29
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Freddy Teddy's Adventure	Topologika	£19
Fun School 2	Europress	
– age -6, age 6-8, age 8+	each	£17
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– age -5, age 5-7, age 8+	each	£18
Fun School 4	Europress	
– age -5, age 5-7, age 7-11	each	£18
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Genesis II	Oak	£99
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Giant Killer Support Disc	Topologika	£24
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Granny's Garden	4mation	£23
Granny's Garden Resource Pack	4mation	£15
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Hearsay II	RISC	£69
HelixBasic	PDK	£79
!Help 3	Sherston	vo £11
Hero Quest	Krisalis	**£24**
Hilighter, age 7-16+	Sherston	£42
History Costume, sprites	Micro Studio	£16
Holed Out Compendium	Fourth Dim	£18
Home Accounts	Minerva	£34

Title	Publisher	Price
HotLink Presenter	Lingenuity	**£19**
House of Numbers	Chalksoft	£20
Hoverbod (not OS 3)	Minerva	£11
Ibix the Viking (not OS 3)	Minerva	£11
I²C SWI	Baildon	£15
– bought with Oddule		£5
Illusionist	Clares	£69
Illustrators' Graphics, draw/sprites	Micro Studio	£16
Image Animator	Iota	£68
Image OCR	Iota	£POA
Image Outliner	Iota	£72
Imagery	Palette Studio	£70
Imagine (Version 2)	Topologika	£44
Impact!	Circle	£47
Impact! Demo	Circle	£2
Impression	CC	£123
– network version		£650
– site licence		£545
– extra hardware key for sites only		£15
– extra manual for sites only		vo £8
Impression	Dabs	vo £14
– with disc		£17
Impression Borders	CC	£19
Impression Business Supplement	CC	£39
Impression Junior	CC	£69
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Instigator	Dabs	£39
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Ixion	Software 42	**£18**
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James Pond	Krisalis	£19
Jet Fighter	Minerva	£10
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Jigsaw	4mation	£19
Junior Database	Iota	£45
Junior PinPoint	Longman	£23
Karma	Periscope	£20
Keyboard Player	Chalksoft	£17
Keylink Prolog	Keylink	£69
Kid Pix	ESM	£35
Knowledge Organiser	Clares	£42
Knowledge Organiser 2	Clares	**£84**
Krisalis Collection	Krisalis	£21
Landmarks – Aztecs, Civil War, Columbus, Egypt, Elizabeth I, Rain Forest, Second World War / Victorians		
– each	Longman	£18
Last Days of Doom / Hezarin	Topologika	£17
Last Ninja	Superior	£19
Lemmings	Krisalis	£19
Letters and Pictures	Chalksoft	£20
Lexicon Dictionary – French, German		
– each	Stallion	£19
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Lexicon – French, German –each	Stallion	£39
Lexicon – Russian	Stallion	£44
Linkword – French, German, Spanish		
– each	Minerva	£37
Little Red Riding Hood, age 5-8	Selective	£14
Logo	Longman	£55
LogoPlotter	Longman	£20
Lotus Turbo Challenge 2	Krisalis	£19
Maddingly Hall	Minerva	£11
Mad Professor Mariarti	Krisalis	£14
Magpie	Longman	£40
Mah-Jong European – The Game	CIS	£19
Mah-Jong Patience	CIS	£19
Mailshot	Minerva	£27
Manchester United Europe	Krisalis	£19
Manchester United Football Club	Krisalis	£19
Maps and Landscapes 1	Chalksoft	£19
Maps and Landscapes 2	Chalksoft	£19
Mark Master	Chalksoft	£67
Master Break	Superior	£14
Masterfile (Version 3)	RISC	£49
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Mazes, drawfiles	Micro Studio	£16
Memory Magic	CIS	£12
Mental Maths	CIS	£16
MicroDrive 2	CIS	£25
MicroDrive Designer	CIS	£25
MicroSpell 3.XX	David Pilling	£5
Micro Trader Accounts	PRES	£270
MiG-29 Superfulcrum	Domark	£29
Military History, sprites	Micro Studio	£16
Minotaur	Minerva	£8
Missile Control	Minerva	£8
Mogul	Ace	£20
Money Matters	Triple R	£15
Movaword	Chalksoft	£17
MultiFS	Arxe	£27
Multistore version II	Minerva	£154

from Morley. solution.

Tape Archive

Tape archive systems tend to be regarded as expensive add ons to an Acorn system. The part that people tend to forget about is how valuable is their data? If you manage a network just think how much time and cost would be wasted if the hard disc failed without you having a recent back-up. Using standard floppy discs for back-up is one option but is incredibly tedious if large amounts of data are invloved.

The answer is a Morley Tape Archive system. With every system sold we supply a FREE copy of SAS (Safe & Sound) archiving software to make backing up and restoring as simple as possible. Don't get caught out!

External 250Mb system	£799.00

(Includes SCSI Interface & one 250Mb tape)

Consumables

250Mb Tapes	£24.99
150Mb Tapes	£19.99



Floptical® Systems

The new Floptical® system has been developed in the USA by Insite Peripherals of California while the drives are being manufactured by Matsushita of Japan (one of the worlds largest electronic manufacturers). 3M and Hitachi are currently producing the special 21Mb discs which give this incredible amount of storage. Morley have developed the drive for use on the Acorn range of RISC OS computers and this can now read and write standard 800k and 1.6Mb floppies as well as the 21Mb Floptical® discs. Using the 21Mb discs these drives are approximately twice as fast as normal floppy drives making them perfect for use as a backup system or general purpose program/data storage.

External 21Mb system	£499.00
A5000 internal 21Mb system	£425.00

(Both include SCSI Interface & one disc)

Consumables

21Mb disc each	£24.00
Pack of 5 x 21Mb discs	£99.00



Other Prices

RISC OS CD ROM DISCS

Creepy Crawlies (MDI)	£99.00
Grooves (MDI)	£59.00
Image Warehouse (MDI)	£59.00
Dictionary Of The Living World (MDI)	£175.00
Hutchinsons Encyclopedia (PEP)	£99.00
Woodland (APA) (Incl. free RUCD)	£150.00
Frontier 2000 (CSH)	£175.00
Revelation 2 (Longman Logotron)	£139.00
British Birds (ILP)	£150.00

Other Products

Morley Analogue & User I/F	£59.00
Morley SCSI card (inc. CDFS)	£149.00
Morley cached SCSI card (inc. CDFS)	£199.00
CD Caddies	£6.50

Monitors

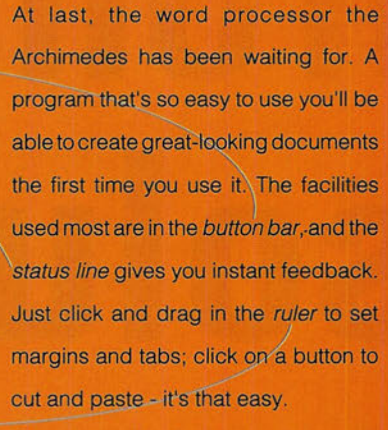
Microvitec CubScan 14" 0.28dp DMS	£399.00
Microvitec AutoScan 20" 0.31dp DMS	£1,049.00

Please note that all prices exclude VAT and carriage. E & OE



Morley House, West Chirton, North Shields
Tyne & Wear, NE29 7TY
Tel (091) 257 6355
Fax (091) 257 6373
Intl. Tel (+44) 91 257 6355

news from Colton Software

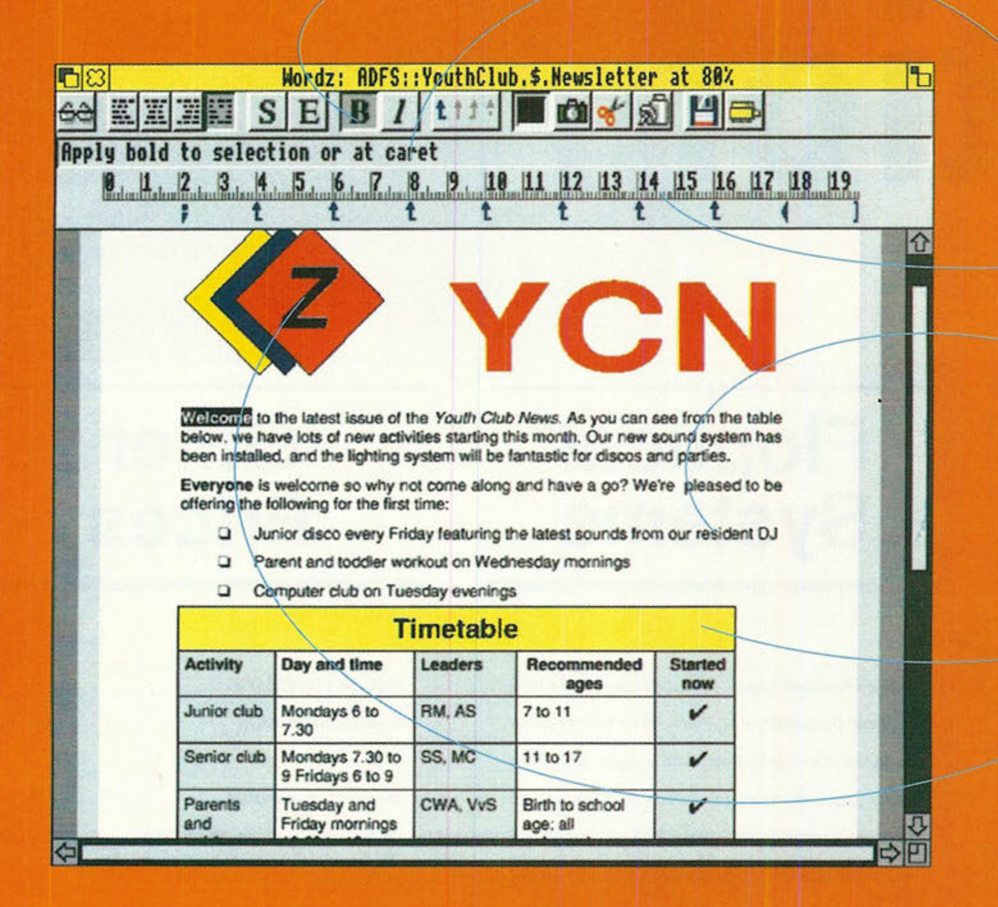


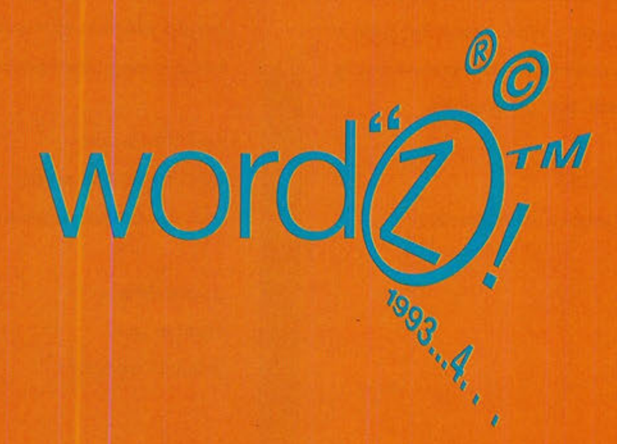
At last, the word processor the Archimedes has been waiting for. A program that's so easy to use you'll be able to create great-looking documents the first time you use it. The facilities used most are in the *button bar*, and the *status line* gives you instant feedback. Just click and drag in the *ruler* to set margins and tabs; click on a button to cut and paste - it's that easy.

Wordz has all the features you'd expect from a state-of-the-art word processor. The powerful style editor gives you complete control over all aspects of your text; *font, spacing, margins,* and *colour*. Unparalleled control over *tables* including dragging to resize columns and rows. Speedy check-as-you-type or whole document spell checking. Import *pictures* and text from other programs, including PipeDream.

Wordz is the first of a family of programs which share the same easy user interface and include dynamic data linking. The spreadsheet Resultz will be available in mid-1993.

Wordz costs £99+VAT. *"Is it easy to use? It's falling-off-a-log easy to use."*





for a free Wordz brochure, complete and return this coupon

name

address

COLTON software

2 Signet Court, Swanns Road,

Cambridge CB5 8LA

Telephone 0223 311881

Fax 0223 312010

Nature Graphics, draw/sprites Micro Studio £16
Naughty Stories (set of 6) Sherston £48
Navigator Topologika £39
Nebulus Krisalis £19
Nevryon Fourth Dim £15
Newton Longman £20
Night Sky Clares £67
Nominal Ledger Minerva £78
Noot 4mation £41
Noot Art Disc 4mation £10
Notate Longman £42
Note Invaders Chalksoft £20
Numbers and Pictures Chalksoft £20
Number Zoo, age 3-6 Selective £14
Numerator Longman £39
Numerator Chaos Longman £18

Oh No! More Lemmings
(requires Lemmings) Krisalis £15
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Order Processing/Invoicing Minerva £78
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Orrery Spacetech £93
Ovation RISC £85
Overload Clares £13

Padlock ICS £10
– site licence £30
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Pappus Computer Tutorial £17
Paradroid 2000 Coin-Age £22
PC Access Minerva £19
PC Emulator 1.8 Acorn £89
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Pendown Etoiles Longman £49
Pendown Outline Fonts Longman £19
Pendown Plus Longman £68
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Perspectives TechSoft £44
Pesky Muskrats Coin-Age £19
Picture Book Triple R £15
Picture It! Appian £29
– Topic discs each £9
PinPoint Longman £65
– site licence £390
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PipeDream 4 Colton **£128**
PipeDriver Dot 1 ICS £10
Pipe Mania Empire £18
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Placard ICS £10
– site licence £30
Plague Planet Alpine £13
PlayBack RISC £19
Play It Again Sam 1 Superior £20
Plot Clares £POA
Podd ESM £25
Polyominoes Topologika £29
Populous Krisalis £22
Poster 4mation £75
Powerband Fourth Dim £20
PowerROUTER Silicon £159
Prehistoric Animals, sprites Micro Studio £16
Premier Circle £71
– DataBase Circle £25
– WordProc Circle £25
Presentation Task Force £POA
Presenter GTi Lingenuity £66
PrimeArt Minerva £69
PrimeMover Minerva £POA
PrimeWord Minerva £54
Printer Drivers, RISC OS:
BJ-10ex / BJ-200 TurboDriver + Cable CC £42
BJC-800 TurboDriver + Cable CC £89
CA (Canon PW1080A), CC (ColourCel), HP (HP Colour), JX (Epson / Star / Citizen colour) – each Ace £14
Deskjet 500C, Epson / Star colour – each RISC £15
!Printers upgrade Ace £25
ProDrivers: Canon LBP8, Epson ESC-P2, HP Colourjet – each Ace £37
Pro Artisan Clares £70
ProArtisan 2 Clares £POA
ProCAD Minerva £394
Programming in ANSI Standard C on the Archimedes Sigma v0 £15
Prophet (requires 2 Mb) Apricote £132
Prophet Demo Apricote £10
Protext Arnor £117
Provocator Computer Tutorial £15
Puncman 1 and 2 Chalksoft £16
Puncman 3 and 4 Chalksoft £16
Puncman 5 to 7 Chalksoft £18
Punctuate Xavier £31
Punctuate! Topologika £25
Purchase Ledger Minerva £78

Quest for Gold Krisalis £19
QuicKey ICS £10
– site licence £30

Real McCoy 2 Fourth Dim £23
Real McCoy 3 Fourth Dim £23
Recall, age 8-13 Sherston £39
Redshift Minerva £10
Render Bender I Clares £58
Render Bender II Clares £78
Reporter Minerva £29
Repton 3 Superior £14
Resultz Colton £POA
Revelation 1 Longman £39
Revelation 2 Longman £75
Revelation 2 CD Rom Longman £98
Revelation ImagePro Longman £127
Reversals Chalksoft £17
Rhapsody 2 Clares £45
Rhapsody 3 Clares £POA
Rhythm-Bed Clares £39
RiscBASIC Compiler Silicon £79
RiscForth Compiler Silicon £79
Risc OS Companion Vol 1 Oak v0 £49
Risc OS Extras 1992 Acorn £9
Risc OS Programmer's Reference Manual Acorn v0 £79
Risc OS Style Guide Acorn v0 £11
RoboLogo Silicon £39
Round the World Yacht Race, age 9+ Storm £29

Sales Ledger Minerva £78
Saloon Cars Deluxe Fourth Dim £25
– Deluxe Extra Courses Fourth Dim £16
S-Base Developer Longman £175
S-Base Developer Plus Longman £275
S-Base Personal Longman **£95**
Schema Clares £89
Schema 2 Clares £POA
Science, drawfiles Micro Studio £25
Score Draw Clares £44
Scorewriter EMR
– PMS Dot matrix, Version 1 £127
– PMS Dot matrix, Version 2 £147
– PMS PostScript £422
ScreenPlay Widgit £35
ScreenTurtle Topologika £44
Search and Rescue, age 9+ Storm £27
Seashore Guide, drawfiles Micro Studio £16
Serenade Clares **£109**
Sesame Street Electric Crayon
– Letters for You £16
– Numbers Count £16
ShapeFX Data Store £10
ShareHolder Silicon £106
ShareHolder Professional Silicon £234
Shylock Gnomes, age 10-15 Selective £16
Sim City (due April) Krisalis £24
SkyHunter Longman £22
smArt 4mation £50
smArt Aliens, Animals, Dinosaurs, Egypt, Faces*, Fantasy, Fashion, Fiddles & Drums, Heraldry, Homes*, Leisure*, Look Smart, Smartoons, Trees and Gardens *Please specify English, French, German, Spanish or Welsh – each 4mation £15
smArtFiler 4mation £32
smArt Modern Languages 4mation £19
Smudge the Spaniel, age 4-8 Storm £22
Snippet (new version) 4mation £32
Soapbox Xavier £34
SolidCAD Silicon £79
SolidsRender Silicon £79
SolidTools Silicon £234
Sound Engineer EMR £69
Sound FX Maker CIS £31
Spark David Pilling £5
SparkFS David Pilling £20
Sparkle Morley £59
Special ICS £10
– site licence £30
Speech! Superior £14
Spelling week-by-week Chalksoft £21
Spex ExpLAN £88
Spheres of Chaos Matt Black £19
Splash, age 7-11 Sherston £19
Splice Ace £29
Split an Image Sherston £15
Spooler Computer Tutorial £9
Sporting Triangles CDS £19
SportsDay Selective £22
SportsPeople Selective £22
SpriteEd Computer Tutorial £17
SpySnatcher Topologika £12
Square Route Computer Eyes £16
StartWrite Icon £55
Stock Management Minerva £78
StockPack Topologika £39
Studio24Plus Version 2, age 11+ EMR £149
Studio24Plus Version 3, age 12+ EMR £210
SuperDump Silicon £20
Superior Golf Superior £14
SuperPlot Silicon £20
Supersounds CIS £15
Supersounds 2 CIS £15
Swiv Krisalis £19
System Delta Plus II Minerva £50
– Reference Guide Minerva v0 £25

TABS ExpLAN £95
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Talking Pictures Wyddfa £16
Target Maths Triple R £15
Technodream (Nevryon 2) Superior **£20**
TechWriter Icon **£159**
Thinklink Xavier £29
Thundermonk Minerva £11
Tiles Brain Games £16
Timetabler Minerva £549
Time Traveller ESM
– Britain Since the 1930s £27
– The Victorians £POA
TinyLogo/Draw Topologika £34
TinyPuzzle Topologika £24
Titler Clares £119
Toolkit Plus Clares £35
Tools Graphics, drawfiles Micro Studio £23
Top Banana Hex £19
Topographer Clares £67
Touch Type Iota £39
Tower of Babel Cygnus £17
Trace David Pilling £5
Tracer Midnight £46
Tracker Leading Edge £37
Transport, drawfiles Micro Studio £25
Trivial Pursuit Domark £22
Turbo Type CIS £20
Tween Ace £26
Twin Acorn £24
Twin World UBI Soft £14
TWO (Task and Window Organiser) ICS £10
– site licence £30
TypeStudio RISC £39

Utility Disc 1 Data Store £8
Utility Disc 2 Data Store £13
Utility Disc 3 Data Store £7
Utility Collection Data Store £21

Vector 4mation £75
View»Mac 3 Human £65
– Arc/Mac Cable Human £24
Viewpoints, age 7-12 Sherston £37
Vox Box Clares £46

Waterloo (not OS 3.1) Turcan £19
Whale Facts Topologika £34
WindowEd Armen £27
Word Bank Topologika £25
Words and Pictures Chalksoft £18
WordWorks CC £38
Wordz Colton **£89**
World Championship Boxing Manager Krisalis £18
World Geography Maps, draw Micro Studio £23
World Map Study, age 7-16 ESM £42
Worldscape Leading Edge £17
World Wildlife, sprites Micro Studio £16
Worra Battle Oak £15
WorraCAD Oak £83

X-Fire Fourth Dim £18

Yacht 2 Computer Tutorial £49
Yacht 7 Computer Tutorial £94

Zarch Superior £14
Zelanites (not OS 3) Micro Power £15

HARDWARE

MEMORY . . .

Fitting extra unless otherwise stated
† Fitting easy ‡ Fitting needs expertise

A3000 2 Mb Upgradable † Atomwide/IFEL £47
A3000 4 Mb † Atomwide/IFEL £110
A3010 1-2 Mb £49
A310 2 Mb Upgradable soldered ‡ IFEL £88
– as above + MEMC1a £124
– as above + MEMC1a + fitting £154
A310 4 Mb soldered + MEMC1a ‡ IFEL £180
– as above + fitting £210
A5000 2-4 Mb Non-upgradable † Atomwide £85
A5000 2-4 Mb Upgradable † Atomwide £99
A5000 2-8 Mb including fitting Atomwide £500
A5000 4-8 Mb including fitting Atomwide £391
A540 4 Mb † Atomwide £POA

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COMPUTERS . . .

A3010 1MB FD Family Solution Acorn £420
Family Solution + ideA
Special price when you buy an A3010 with an ICS internal hard disc upgrade:
– Family Solution + 20 Mb hard disc £599
– Family Solution + 60 Mb hard disc £675
– Family Solution + 80 Mb hard disc £715
– Family Solution + 120 Mb hard disc £799
A3010 2MB FD Learning Curve with Monitor Acorn £675
– as above + JP150 Printer £889
A3020 2MB FD Acorn £749
A3020 2MB HD60 Acorn £899
A4 2MB FD Acorn £1395
A4 4MB HD60 Acorn £1695
A4 4MB HD80 Acorn **£1699**
A4 4MB HD120 Acorn £1799
A4 Extra Battery Pack Acorn £50
A4 Shoulder Bag Acorn £35
A4000 2MB HD80 Acorn £945
– as above + Home Office £995
A5000 2MB HD80 Multiscan Acorn £1395
– as above + Learning Curve £1455
Pocket Book Acorn £212

MISCELLANEOUS. . .

386 PC Expansion Card 25 MHz Aleph One
– 1 Mb £374
– 4 Mb £468
486 PC Expansion Card Aleph One
– 1 Mb £463
– 4 Mb £557
4-slot 4-layer Backplane IFEL £57
9060S Monitor Eizo £450
A300/400 Fan kit ICS £15
A3000 Expansion Box Wild Vision £135
A310 RISC OS Carrier Board ‡ IFEL £21
A5000 Fitting Kit for second hard disc ICS £15
Arckey Function KeyStrip Holder ICS v0 £3
– pack of 4 v0 £10
ArcNET ACS £69
ARM3 ‡ Aleph One/IFEL £175
ColourCard CC £238
Dongle Dangle with screw fittings ICS £6
Fan filters (pack of 10) (not A5000) ICS £6
FaxPack CC £289
Floppy Discs, 10 × 3½" High Density £10
G8 Plus State £238
G8 Plus Video Switch State £23
G8 Professional State £348
HiPoint Mouse for A4 Genius £49
Micro Mouse Clares £26
Monitor Stand for A3000 ICS £21
Podule Case for A3000 HCCS £16
RISC OS 3 Upgrade Acorn £41
– Bulk package Acorn £335
– A5000 Acorn £17
Seal 'n Type spill-proof Keyboard Covers
– Archimedes / A5000 Kador £14
– A3000 Kador £14
TouchWindow Lindis £234
Whisper Fan Quietener (for A300/A400 series only) ICS £15
Wizzo IDE Filing System on rom ICS
– Wizzo4 for A4 £29
– Wizzo5 for A5000 £29

I²C PRODUCTS . . .

AnDi Oddule Baildon £39
I²C Adaptor (needed unless you already have an I²C socket) Baildon £10
I²C SWI (enhanced IIC_Control) Baildon £15
– bought with Oddule £5

For ordering details please turn to page 3



PRINTERS . . .

ArcLaser 300-6	Calligraph	£895
ArcServer 300-8	Calligraph	£985
Bubble Jet BJ-10ex	Canon	£187
Bubble Jet BJ-10ex + TurboDriver	Canon/CC	£219
Bubble Jet BJ-20	Canon	£255
Bubble Jet BJ-200	Canon	£282
Bubble Jet BJ-300	Canon	£299
Bubble Jet BJ-330	Canon	£405
Bubble Jet BJC-800 + TurboDriver	Canon/CC	£1499
DeskJet 500	Hewlett-Packard	£299
DeskJet 500C	Hewlett-Packard	£375
DeskJet 550	Hewlett-Packard	£475
Laser Direct HiRes4 with 50-sheet tray	CC	£899
– 250-sheet Paper Cassette		£99
Laser Direct HiRes8	CC	£1280
Laser Direct LBP-4 Card	CC	£325
LBP-4	Canon	£659
Refill toner cartridge for Canon EPS		£50
New toner cartridge for Canon LBP-4		£59

SCANNERS, DIGITISERS . . .

ArcScanner including Epson GT-4000	Clares	£1660
Colour Converter	Lindis	£145
FaxScan	Spacetech	£94
Handipad	TechSoft	£173
Hawk V9	Wild Vision	£199
– A3000 version	Wild Vision	£278
Hawk V9 MkII	Wild Vision	£259
HiVision Digitiser Colour	HCCS	
– A3000 External		£137
– A3000 Series / A4000 Internal		£124
– A5000 / 300 / 400		£124
– Upgrade from Vision		£45
iMage (Sharp JX-100)	Irlam	
– for A5000		£490
– for other computers		£589
Image Scanner	Iota	£383
– Colour Upgrade Kit	Iota	£239
– Fast Parallel Card	Iota	£98
i-Scan 200	Irlam	£539
i-Scan 400	Irlam	£589
Pineapple Colour Video Digitiser	Pineapple	£195
– A3000 boxed	Pineapple	£230
ProImage (Epson GT6000)	Irlam	
– for A5000		£989
– for other computers		£1089
Scan-Light A4	CC	£277
– with Sheet Feeder	CC	£360
Scan-Light 256	CC	£190
– A3000 internal	CC	£190
Scan-Light Professional	CC	£565
– as above + SCSI interface	CC	£699
SnapShot Colour Video Digitiser	Lingenuity	£195
– A3000 version	Lingenuity	£275
Spectra	RISC	
– Archimedes / A5000		£545
– A3000 Series / A4000 Internal		£545
– A3000 External		£555
Vision Digitiser	HCCS	
– A5000 / 300 / 400 Mono		£48
– A5000 / 300 / 400 Colour		£76
– A3000 External Mono		£60
– A3000 External Colour		£89
– A3000 Series /A4000 Internal Mono		£48
– A3000 Series / A4000 Internal Colour		£76

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HOW TO ORDER

VAT: Zero-rated items are marked V0. UK customers please add 17.5% to all other prices. EC customers outside the UK (including BFPO) please do the same unless you are VAT registered, in which case quote your international VAT number. Ours is GB 595 7258 84.

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Overseas carriage: If you are paying by credit card we will add airmail and insurance at cost. Otherwise please add £6 (Europe) or at least £12 (elsewhere) for each software item and send a pounds sterling bank draft payable at a London clearing bank, or Eurocheques for not more than £100 each.

Credit cards are welcome. We do not charge your account until your order is fulfilled. Your name and address must be as known to the credit card company. If you are leaving an order on our answering machine please include your telephone number, the expiry date of your card, and your calculation of the total payment due. We will make no charge for credit card commission unless we have informed you first.

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LICENSED CREDIT BROKER



ACORN TURBOPOWERS THE 3010

ACORN was the only computer manufacturer to attend the recent 7th International Computer Show at Wembley. Acorn's highlight was the launch of a new package. based on the existing Acorn A3010 bundle.

The Family Turbo Pack, contains an A3010, the *Lotus Turbo Challenge 2* game, a Quickshot joystick, £200 worth of software vouchers and a year's on-site maintenance agreement. The inclusive price of the pack is £499 including VAT.

The stand also featured a competition which is based on the *Lotus Turbo Challenge 2* game and run jointly with Lotus Cars. Show visitors tried out their driving skills in the competition. Acorn plans to run this competition at the *Acorn User* Spring Show and through participating Acorn dealers between 15th March and the end of August.

Four regional finalists will win a visit to the Lotus car factory in Norfolk. They will then take part in a national final to vie for an all-expenses paid trip to the Italian Grand Prix in September.



Acorn's sales drive goes into higher gear

Other familiar Acorn suppliers, such as Minerva, turned up at the 7th International computer show, and although the Acorn presence was modest, it was greater than that of previous shows.

NEWS IN BRIEF

● This year's Bett show, held for the first time at the National Hall Olympia, was a resounding success. 14,389 teachers and education administrators attended the show over its four days, a record figure.

Acorn firms netted prizes in the annual educational technology awards, with Sherston Software gaining a Gold Award in the Primary Category for *Crystal Rainforest*, and a bronze for Northwest SEMERC in the same category for its Oldham Overlay keyboard. Longman Logotron netted a bronze in the Secondary Category for its *Eureka* spreadsheet.

● Minerva Software has reported that it has found a well-known dealer copying its *EasiWord* word processor application without permission. Copies were supplied with A3020 computers sold to customers. Apparently, photocopied documentation was also offered.

While *EasiWord* is bundled with some A3010 computers, it is not in the public domain. However, Miverva has invited dealers wishing to bundle *EasiWord* for their customers to contact the company for details of 'special arrangements' which could be made. Minerva is on (0392) 437756.

● The successful Bubblejet printer from Canon has been reincarnated yet again. Canon's latest is the BJ-10sx, based on the BJ-10ex, currently the UK's best-selling printer.

The BJ-10sx has a RRP of £345+VAT compared to £299+VAT for the BJ-10ex, but street prices are considerably lower. The BJ-10ex remains in the Bubblejet model range and the BJ-10sx is positioned inbetween the BJ-10ex and the BJ200 (£399+VAT) announced last year.

The BJ-10sx has a faster printing speed than the BJ-10ex, and the extra £46 also provides for a redesigned control panel. A 50-sheet paper feeder, which is larger than that available for the BJ-10ex, is optional, as is a battery pack for mobile use. For more information contact Canon UK free on (0800) 252223.

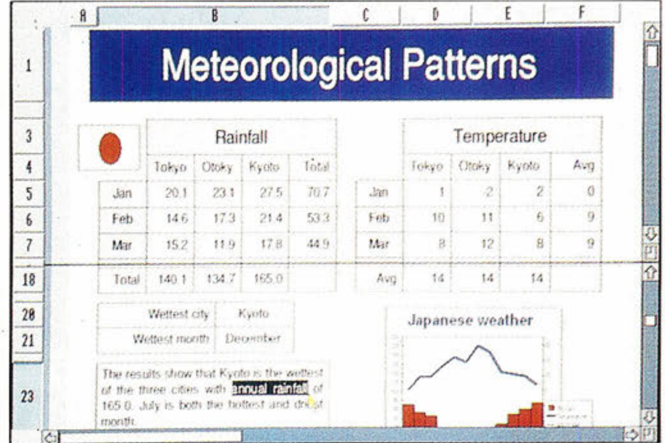
GETTING THE RESULTZ

COLTON Software has begun shipping its new easy-to-use but fully-featured word processor, *Wordz* at £99+VAT.

Colton Software has also been working on *Resultz*, its new stand-alone spreadsheet. *Resultz* and *Wordz* were developed in parallel, so data sharing will be a key feature.

Resultz is a fully Risc OS compliant package. As with *Wordz*, ease of use is a priority and a version of the *Wordz* button bar is featured. *Resultz* will be shown at the *Acorn User* Spring Show.

For more details, contact Colton Software on (0223) 311881.



Resultz is Colton's forthcoming easy-to-use spreadsheet

HCCS CUTS RAM PRICES

HCCS has announced extensive cuts in prices of memory upgrades for the A3010, A3020 and A4000. The new 4Mb upgrade for the 3010 now costs £149. The A3010 1Mb Ram upgrade drops by £10 to £35, while the A4000/A3020 2Mb Ram upgrade drops to £69.33. Prices include VAT.

Soon to supplement HCCS' micropodules will be an analogue interface (£29), laser Express direct-drive printer controller (£249), a colour composite video output card (£49), high-speed serial interface (£49), Midi controller/ sound sampler (£49), Ethernet and scanner interfaces.

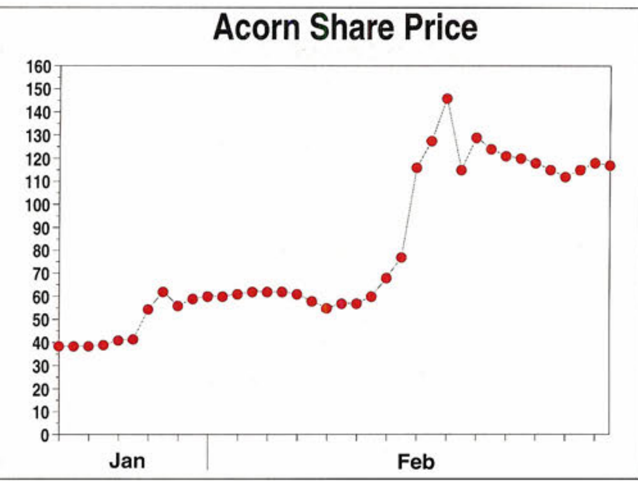
A version of the MultiPodule for the A300, A400, A540 and A5000 has also been announced. HCCS is on 091-487 0760 and can be seen at the *Acorn User* Spring Show.


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ACORN SHARES REACH NEW HIGHS

THE ACORN share price continued its dizzying progress during February. The price has settled down to around 115p, but even at this level the price is roughly 40p up on the previous month, a rise of over 50 percent.

Acorn's share price is now no less than three times its value at the start of the new year. However, the investors' enthusiasm for Acorn shares is clearly linked to the company's 46 percent shareholding in Arm Ltd. The value could now be set for further fluctuations as, just a few days prior to *Acorn User*'s publication, Arm Ltd was due to announce a small but important investment by a Japanese company.



38 days of rising share prices

Acorn's share price first rose sharply after 3DO announced in January that it was to use an Arm60 Risc processor in its new games console. This was closely followed by another announcement, this time from IBM, which endorsed Risc technology and boosted the existing level of interest.

A variety of rumours have circulated since, regarding the sudden rise in Acorn's share price. Acorn's managing director, Sam Wauchope, in an interview with the *The Independent*, refused to discuss rumours that the Japanese electronics giant Matsushita, which is backing 3DO, was about to take a stake in Arm Ltd. Wauchope was reported as saying that discussions were underway with various companies. The US telecommunications and electronics group AT&T, an investor in a rival to the Arm chip called the Hobbit, was also rumoured to be interested in Acorn, in which Olivetti has a major shareholding.

So was all the guesswork close? Last month, *Acorn User* predicted that some important Arm Ltd news was imminent. This month the news was revealed as an announcement, scheduled for 9 March, that the Tokyo-based Nippon Investment & Finance Co. Ltd. (NIF) is to take a modest £650,000 stake in Arm Ltd. NIF's managing director Sadao Kunieda commented: 'We have decided to invest in Arm because it has outstanding technology, matching the current and future trend of downsizing in microprocessors and products using microprocessors.'

He added: 'We believe the company's technology will offer tremendous business possibilities.'

Arm Ltd's managing director, Robin Saxby, told Acorn User that while the investment was small in cash terms, the company had secured a vital strategic partner in Japan.

Arm Ltd will be opening up an office in Tokyo to service what they hope will be a number of new Japanese customers for Arm technology.

PANASONIC HUSHES UP

THE latest in Panasonic's QuietPrinter range has been unveiled. The KX-P2124 is claimed to be quieter than most laser or inkjet printers. The price for the KX-P2124 is £395+VAT, and a seven-colour upgrade kit is an optional extra for £45+VAT. Panasonic is on (0344) 853431.



Panasonic's KX-P2124: Quiet as a mouse

NETSHAKE

AF Electronics' next Econet product *MasonNet* should be ready for an April release date, in time for the Spring Show. Latest timings on machines fitted with *MasonNet* show an overall increase in data rates of 100-250%. Programmer Les Mason says: 'We use the data itself to increase the rate of communication, a standard network will benefit with just two cards installed. A new *Phunle* handshaking protocol has been hardwired into the output stages of a standard network chip to reduce the error rate and thus boost the usable bandwidth and thus the speed of the net.'

Patrick Jacolé

NEWS IN BRIEF

● Brian Dye of Hewett School in Norwich has produced a set of activity sheets for the Longman Logotron *Numerator* mathematical construction kit application which runs under Risc OS or MicroSoft Windows. *Numerator* (Archimedes price £39+VAT) can be used as a general tool for exploring the fascinating world of numbers using graphics. The activity sheets are available in a book called *Numerator Workcards* free of charge to existing users of *Numerator*. If you are a registered user, contact Longman Logotron on (0223) 425558.

● Vision Six Ltd is to cease trading. Vision Six products will live on at the same address with the same phone and fax numbers under the auspices of W.C.Smith & Associates. The change is described as a move to reduced unnecessary company overheads. Vision Six products include a specialist Archimedes software package used for computer aided structural analysis (Casa). A new Risc OS 3.1 version of the application has now been developed. W.C.Smith can be reached on (0665) 510682.

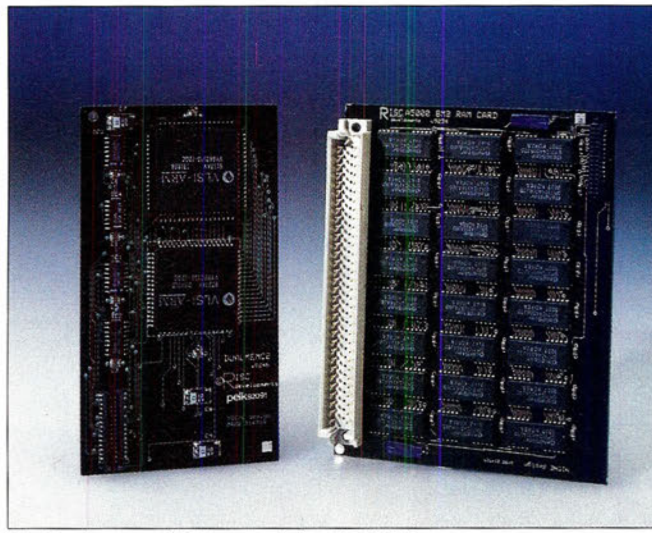
● In the February News we incorrectly described Soft Rock Software as public domain software specialists. In fact Soft Rock specialises in low-cost software and only some demo releases are actually public domain. If you are not sure if some software you have is public domain or not, always check the copyright notice and any text files accompanying the application.

● A new low-cost CD-Rom mastering service is now available from Eesox in Cambridge. An initial CD-Rom produced using an ISO 9660 write-once or Worm method can be reproduced for just £150. Extra copies can be made at around £45 a go. Mark Watson at Eesox points out that you can use the service for simple applications like archiving your hard disc contents to CD-Rom or for creating your own personalised multimedia publications. Jobs can usually be turned around within 24 hours, and Eesox has plenty of experience mastering Acorn format CD-Roms. Eesox can be contacted on (0223) 264242.

RISC DEVELOPMENTS STEPS OUT

There has been a flurry of activity at Risc Developments over the last month. A new A5000 8Mb Ram card and a range of AUN-compatible Ethernet cards have been launched. Moreover, there was proof that interest in Acorn machines certainly isn't lacking: a Beebug A5000 special offer sold out in two days.

The new Ram upgrade is designed to bring 2Mb or 4Mb A5000s up to a full complement of 8Mb Ram. A5000 owners who already have an earlier 4Mb Risc Developments upgrade can trade in their original for £60. Unfortunately the card must be fitted by an approved Acorn Service Centre (such as Risc Developments' sister company Beebug) for the card to be installed. The cost of upgrading a 2Mb A5000 is £499+VAT and for a 4Mb A5000 it is £429+VAT.



Risc Developments' 8Mb upgrade for the A5000

Risc Developments is the latest firm to produce Ethernet interfaces for the Archimedes range. Cards have been developed for the A5000, A3000, A3010 and A3020. 10base2 (Cheapernet) and 10Base5 (Full Ethernet) connections are supported by certain cards. Beebug and Hertfordshire Computer Repairs have set up a full network installation service which covers the initial planning stage through to card installation and cabling as well as maintenance.

An A3000 and A4000 series card will follow, which will also include a User Port and Analogue port as well as an optional Econet interface. If fitted, the latter will turn an individual machine into a AUN gateway station linking an Ethernet network and an Econet one. Contact Risc Developments on (0727) 840303.

● Finally, that Beebug A5000 special offer. Beebug secured around 60 brand new, latest specification A5000s fitted with 2Mb Ram but without a monitor or hard drive. Included was a £200 bundle of assorted software. The asking price was £699+VAT and Beebug sold out two days later, despite minimum publicity.

One draws the conclusion that Acorn should not underestimate the number of non-education customers, who prefer to buy bare machines so they can fit their own choice of hard disc and monitor.

CC LAUNCHES UPGRADES GALORE

A FREE software upgrade for users of Computer Concepts' Colour Card is now available. The upgrade enables the screen refresh rate to be configured to 25Hz instead of the default 12Hz. This will cause approximately 30 percent extra load on the computer's processor, but the benefit is that noticeable shearing effects on the screen when moving solid windows around are cured. CC has also introduced a version of the card which can be used via the A3000's external podule interface.

CC's new Thesaurus in action, hot linking with Impression

Although we reviewed it last year, CC has only just announced the availability of the answering machine and file transfer enhancements for the FaxPack. These are now standard with all FaxPacks and existing users can obtain the upgrade for free.

There's also a new *ArtWorks* Viewer utility which CC is distributing freely to anybody who needs it.

Finally, next month, CC hopes to release its long-awaited *Thesaurus* utility and some video titling software for the Hawk V9 video digitiser.

Computer Concepts can be contacted on (0442) 63933.

NEWS IN BRIEF

● From Cumana, news of some improvements to the Acorn/Cumana A5000 CD-Rom multimedia starter kit and the introduction of *EasyPrint* for EasyShare users. The multimedia starter kit, which was devised for education customers in conjunction with Acorn, has gained substantial added value as seven CD-Rom publications are now bundled instead of two.

The new range of titles is made up of the *Revelation 2* painting and image processing package plus a library of colour images, *Space Encyclopedia*, *The Times* and *Sunday Times* sampler, *Illustrated Shakespeare*, *Sherlock Holmes* and the *Illustrated Holy Bible*. A £30 voucher towards an annual subscription for the *The Times* and *Sunday Times* on disc is also included. The whole package, comprising a 4Mb A5000, a multiscan monitor and CD-Rom drive, is priced at £1699+VAT.

● *EasyPrint* is a new utility for sharing printers via Cumana's EasyShare SCSI-based networking system. Documents can be queued to printers connected to other Archimedes in the network and the system is compatible with serial, parallel or laser direct drive printer types.

For further information on *EasyPrint* and the CD-Rom starter kit contact Cumana on (0483) 503121.

● A complete electronics training course, *Alpha-Tracks*, has been devised by Silicon Vision based on its *Arc-PCB* design software in conjunction with the Unilab Alpha System Electronics modules.

The course has been designed for training from Key Stage 3 (students aged 13+). Split into three sections, the course covers the use of Alpha modules to design electronics systems, using *ARC-PCB* software and libraries to design and plot a PCB, and finally assembling and testing of the prototype circuit.

Alpha-Tracks is priced at £95 for a site licence, though the *Arc-PCB* software is not included in that price. A demonstration disc is available for £5+VAT.

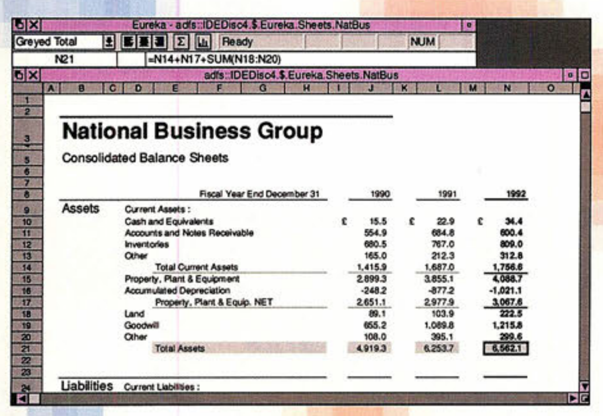
Arc-PCB itself costs £125 single user or £375 for a site licence. For more details contact Silicon Vision on 081-422 3556.

FOR PEOPLE WHO MEAN BUSINESS

ΣUREKA!

Brings the power and innovative features of the very latest in easy-to-use spreadsheet technology to all RISC OS users.

- Fully integrated charting and graphing, including line, scatter, bar, stacked bar, pie and area.
- Picture-style number and text formatting allows full customising of value display.
- Multiple worksheets with file linking.
- Linear and multiple regression analysis.
- Import and export of CSV and Lotus 123 formats; export of Draw format.
- Powerful worksheet formatting with styles, including cell shading, cell borders with different colours and weights.
- Contains over 150 built-in functions.



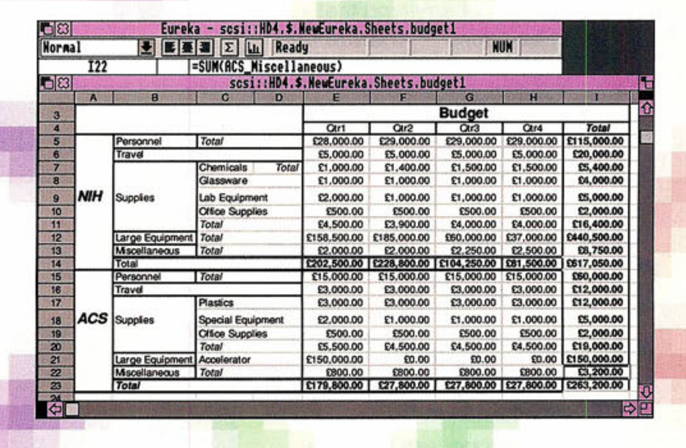
National Business Group

Consolidated Balance Sheets

	Fiscal Year End December 31	1990	1991	1992
Assets	Current Assets :			
	Cash and Equivalents	£ 15.5	£ 22.9	£ 34.4
	Accounts and Notes Receivable	554.9	684.8	600.4
	Inventories	680.5	767.0	809.0
	Other	165.0	212.3	312.8
	Total Current Assets	1,415.9	1,687.0	1,756.6
	Property, Plant & Equipment	2,899.3	3,855.1	4,088.7
	Accumulated Depreciation	-248.2	-877.2	-1,021.1
	Property, Plant & Equip. NET	2,651.1	2,977.9	3,067.6
	Land	89.1	103.9	222.5
	Goodwill	655.2	1,089.8	1,215.8
	Other	108.0	395.1	299.6
	Total Assets	4,919.3	6,253.7	6,562.1
Liabilities	Current Liabilities :			

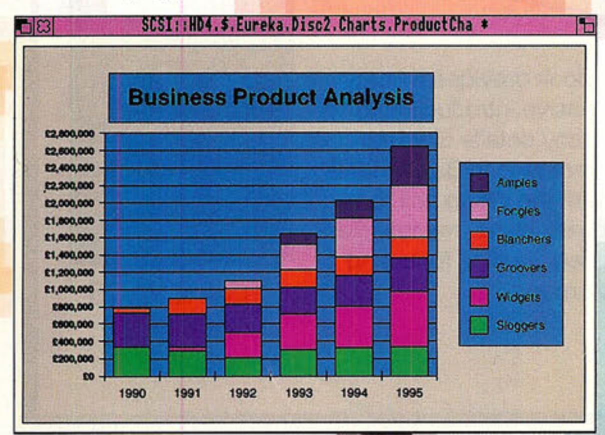
Eureka's advanced DTP-like publishing capabilities encourage you to create the most impressive reports and budgets, making full use of the Acorn Outline Font Manager.

Build and maintain budgets with speed and accuracy. Using Eureka's powerful range naming features ensures you can always remember what your formulae mean, even months later!



				Budget				
				Qtr1	Qtr2	Qtr3	Qtr4	Total
NIH	Personnel	Total		£28,000.00	£29,000.00	£29,000.00	£29,000.00	£115,000.00
	Travel			£5,000.00	£5,000.00	£5,000.00	£5,000.00	£20,000.00
	Supplies	Chemicals	Total	£1,000.00	£1,400.00	£1,500.00	£1,500.00	£5,400.00
		Glassware		£1,000.00	£1,000.00	£1,000.00	£1,000.00	£4,000.00
		Lab Equipment		£2,000.00	£1,000.00	£1,000.00	£1,000.00	£5,000.00
		Office Supplies		£500.00	£500.00	£500.00	£500.00	£2,000.00
		Total		£4,500.00	£3,900.00	£4,000.00	£4,000.00	£16,400.00
	Large Equipment	Total		£158,500.00	£185,000.00	£60,000.00	£37,000.00	£440,500.00
	Miscellaneous	Total		£2,000.00	£2,000.00	£2,250.00	£2,500.00	£8,750.00
	Total			£202,500.00	£228,800.00	£104,250.00	£81,500.00	£617,050.00
ACS	Personnel	Total		£15,000.00	£15,000.00	£15,000.00	£15,000.00	£60,000.00
	Travel			£3,000.00	£3,000.00	£3,000.00	£3,000.00	£12,000.00
	Supplies	Plastics		£3,000.00	£3,000.00	£3,000.00	£3,000.00	£12,000.00
		Special Equipment		£2,000.00	£1,000.00	£1,000.00	£1,000.00	£5,000.00
		Office Supplies		£500.00	£500.00	£500.00	£500.00	£2,000.00
		Total		£5,500.00	£4,500.00	£4,500.00	£4,500.00	£19,000.00
	Large Equipment	Accelerator		£150,000.00	£0.00	£0.00	£0.00	£150,000.00
	Miscellaneous	Total		£800.00	£800.00	£800.00	£800.00	£3,200.00
	Total			£179,800.00	£27,800.00	£27,800.00	£27,800.00	£263,200.00

Eureka offers crisp, accurate business charting in a wide variety of formats.

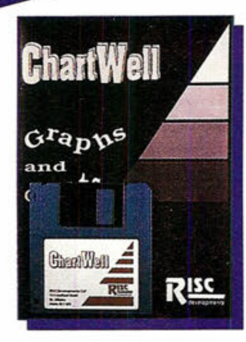


Eureka is priced at £119 + VAT.
For any Acorn computer running RISC OS with 2Mb of RAM or more.
For further information please ring for a brochure.



124 Cambridge Science Park
Milton Road
Cambridge CB4 4ZS
Tel. (0223) 425558
Fax (0223) 425349

ChartWell



ChartWell is a comprehensive but easy-to-use chart and graph package providing bar charts, pie charts, line graphs, scatter graphs and polar plots with a wide variety of types and many user selectable features. Import data from other files in standard formats; export in Draw file format. Flexible data selection and ordering; useful 'save options' feature.

£29.95 inc.Vat
p&p £2.00

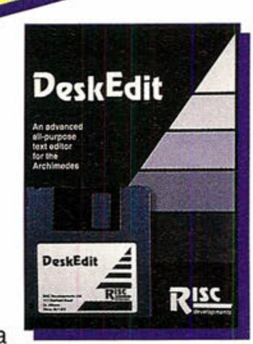
Polyglot



This is a highly flexible package which can be readily customised to the needs of the user. PolyGlot allows you to access all the characters not normally found on the keyboard from simple user defined windows; ideal for word processing, DTP work etc. in foreign languages. Can also be used for other groups of special symbols (e.g. mathematical). Full printer support.

£19.95 inc.Vat
p&p £2.00

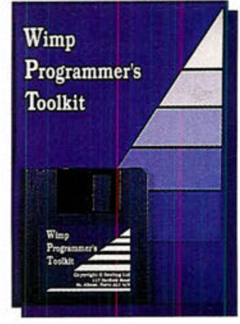
DeskEdit 2



DeskEdit 2 is probably the most comprehensive editor available for the Archimedes with extensive features for editing ASCII text, Basic, C or other programming languages.
"DeskEdit 2 has far more in the way of text editing facilities and a remarkably comprehensive list of features to support Basic and C programmers - indeed it is difficult to think of anything that could be added" - ***Archimedes World, February 1993.***

£31.95 inc.Vat
p&p £2.00

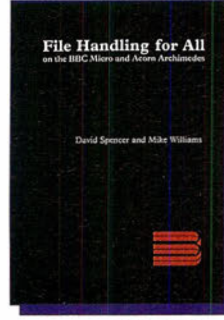
Wimp Programmer's Toolkit



This is a collection of 12 multi-tasking applications to assist in the development and debugging of Wimp programs written in Basic. Ideal companion to the book Wimp Programming for All.

£19.95 inc.Vat
p&p £2.00

File Handling for All by David Spencer and Mike Williams



This book covers in some detail all the principles and techniques required to program file handling applications in Basic including sequential files, indexed files, file and record pointers, search and sorting.

Book **£9.95**
Disc £4.75
p&p £2.00

Wimp Programming for All by Lee Calcraft and Alan Wrigley



This book provides a comprehensive introduction to the many details of Wimp programming in Basic, dealing with the Wimp poll loop, windows, icons, menus, file transfers, outline fonts and much more.

Book **£12.95**
Disc £4.95
p&p £2.00



VISIT THE WORLD OF NUMBER

ACORN, in conjunction with Newmedia, has produced four of the National Curriculum Council's *World of Number* titles on CD-Roms. These titles were only available on interactive video discs running with PC equipment.

Number Games, Decimal Points, Picture Gallery and Perspectives have been transferred to Risc OS-compliant CD-Roms and are in the final stages of testing. All four titles are from the Key Stage 3 and 4 series, and include some of the better interactive games. There are also plans to produce the other six titles on CD-Rom.



The whole World of Number will now be available on CD-Rom

Local education authorities have just been allocated small amounts of funding to trial the full suite of *World of Number* discs in one primary and one secondary school. Unfortunately the money had to be spent before March, so only PC-based interactive video systems could be purchased.

The CD-Rom versions will be more accessible to schools than IV discs in the long term. Pricing has yet to be finalised.

Further details can be obtained from Acorn on (0223) 254254. The CD-Roms will also be at the Acorn User show.

PLAYTIME FOR NODDY

NEW from The Jumping Bean Company is *Noddy's Playtime*, a unique product aimed at children between the ages of three and seven. The package consists of eight programs, staged into three levels, a complete junior art package, and a novel linking and menu system. The different parts take Noddy through various adventures and tasks.

Down at the *Railway*, Noddy plays a memory test involving the Toy Town train, at the *Farm Yard* the task is to assemble the heads and tails of animal. The *Post Office* scene involves Noddy sorting out the letters, but the most promising scenario is definitely the *Police Station* where the player helps Noddy to escape.

Jumping Bean has recently confirmed a place at the *BBC Acorn User* show, so you can see Noddy there. For more details call (0602) 792838.



Noddy goes out on the toy town, courtesy of Jumping Bean

EXPAND IT

TEACHERS who have equipped their classrooms with A3020 or A4000 series machines and are lamenting the lack of expansion slots can now buy a solution.

The HCCS Ultimate board fits into the expansion slot but can carry on it up to three micropodules. These are no bigger than a credit card but can hold a digitiser, SCSI interface, laser express, an analogue port (a user port is fitted as standard), Midi in/out, serial port, video out.

The Ultimate board is priced at £35 and HCCS are anouncing some starter packs to include the board, power supply and one micropodule. The range of micropodules already available is impressive, but it would be nice to see Ethernet cards, PC cards and scanners in this format.

Podules for the A5000, 400 and 300 series will be able to take two micropodules each enabling you to have eight interfaces on your A5000. The boards can be easily fitted by the user.

For more details on the Ultimate system, contact HCCS on 091-487 0760 or go and see them at the *Acorn User* show.

IN BRIEF

● Sherston Software are planning some small changes to their talkning books. This will include the ability to save the pictures for use in other packages so that having read the book pupils can write about it.

If you have any other suggestions about small changes that would enhance their use in classrooms, give Sherston a ring on (0666) 840433.

● 4Mation has produced a Risc OS version of *Granny's Garden*. I needed some convincing that this was worth doing but the graphics are wonderful, especially the baby dragons in their nappies, one on a pogo stick. It's nearly as good as having a brand new piece of software, even if I did know all the answers.

There is a *Granny Resource Pack* available containing a set of Draw files and sheets that can be photcopied. The files come in a compressed format and the compression utility can also be used to shrink your own *Draw* files for loading into other 4mation products and for saving disc space. Details from 4mation on (0271) 25353.

● Historians in both the primary and secondary sector might like to have a look at ESM's new version of its *Time Traveller* software.

Completely rewritten for Risc OS machines it offers pupils the chance to explore time lines and historical events. ESM has produced packs for Key Stages 2 and 3 that are closely allied to the History core study modules such as Britain since the 1930s, Victorian England and Medieval realms.

Packs of printed material are available and the software itself contains quantities of text and picture information about themes such as people, politics, industry and trade.

You can build your own time lines and other core topics are being considered by ESM. Priced at around £30 these packs are worth investigating. For more details, contact ESM on (0223) 65445.

Clare Johnson
Bexley AEC

RISC Developments' Hardware



Ethernet Network Cards

A range of fast Ethernet cards for Acorn computers to be used in conjunction with Acorn's new AUN network software. Together they provide an excellent network system running many times faster than Econet, but still fully Econet compatible. Three types of card are available:

Archimedes / A5000 card which fits in a single expansion slot.
A3000 / A3010 / A3020 / A4000 card which fits in the mini expansion socket.
A3020 / A4000 card which fits in the new internal network socket.

All the cards provide connection to standard 10Base2 Thin-wire Ethernet, and the Archimedes/A5000 card also includes an AUI connector for other network types. As well as supplying Ethernet cards, RISC Developments can arrange a complete networking service from design through to supply, installation and maintenance. Please contact us with your requirements.

4600e	Archimedes/A5000 Ethernet Card Half Width Expansion Card	£139
4601e	A3000 series/A4000 Ethernet Card Mini Expansion Card	£139
4602e	A3020/A4000 Ethernet Card Internal Network Card	£159



Spectra Colour Scanner

Spectra is a revolution in colour scanning systems for the Acorn range of computers. Its clever design means that it is as simple as you could possibly want and yet as powerful as you will ever need, producing professional results every time. It is a flat-bed scanner, which means that you simply lay your original under the scanner, load the program and 'click' on Scan. The scanner will then do the rest, scanning in 16 million colours. The result is a sprite that can be in full colour, 256 grey-scale or mono depending upon your requirements. This is a full multitasking application and so you can continue using the computer even while it is scanning.

The Spectra kits include the scanner itself, an interface card, user guides, software and everything else you need. Versions are available for the Archimedes & A5000, A3000 (External) and A3010, A3020 & A4000 internal.

0118g	Archimedes or A5000	£549
0119g	A3000 internal	£549
0117g	A3000 external	£569



A5000 8Mbyte RAM Card

A new card that upgrades the total RAM of the A5000 to a massive 8Mbytes which is ideal for running a number of today's sophisticated applications together. Versions are available for 2Mbyte and 4Mbyte standard A5000s. Owners of 2Mbyte machines already upgraded to 4Mbyte will need to remove the existing RAM Card, and we will offer a £50 refund if this is a RISC Developments or Acorn model. Please note that because of the nature of this upgrade, it must be fitted by an Acorn approved surface mount service centre. There is no fitting charge when carried out by our own engineers.

0147g	A5000 2->8Mbyte upgrade	£499
0148g	A5000 4->8Mbyte upgrade	£429



A3000 / A3010 / A3020 User Port, Analogue and Econet Card

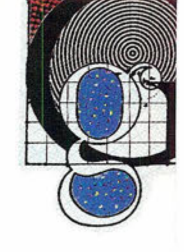
A unique expansion card that provides a BBC-compatible User Port and Analogue converter together with an optional Econet interface all on one board. As well as the price advantage over separate User Port and Econet cards, this board provides a boot ROM to allow Econet to be used with AUN without loading modules from disc. Other possibilities include fitting both Econet and Ethernet interfaces to the A3020 or A4000, allowing them to act as AUN Gateway stations.

4610e	User Port and Analogue Card	£44.95
4611e	User Port, Analogue and Econet Card	£79.95

RISC developments

RISC Developments Ltd.
117 Hatfield Road, St. Albans, Herts. AL1 4JS Tel. (0727) 840303 Fax. (0727) 860263

Educational discounts are available on all products. All prices exclude VAT.



ARTWORKS INVITES COMPETITION

NO SOONER has *ArtWorks* been launched than version 1.10 comes along. Like all of Computer Concepts' programs, *ArtWorks* is under constant development to iron out bugs and add new features.

The main improvement is the addition of a full-screen preview facility, allowing any *ArtWorks* file to be displayed approximately as it would appear in hard-copy form. If the machine running *ArtWorks* has a Computer Concepts Colour Card fitted, this is automatically detected, and *ArtWorks* uses one of the 15-bit colour screen modes.

Combining the effect of dithering with the 32,000 possible colours means you get a picture that is virtually indistinguishable from one produced using 24-bit display hardware. CCs' Charles Moir says: 'The quality improvement is as great as the difference between 16-colour and 256-colour modes.'

ArtWorks' anti-aliasing display algorithm can also be used in the 15-bit colour preview mode to produce smooth lines and curves.

As well as the preview mode, a number of enhancements have been incorporated into *ArtWorks* 1.10, including facilities for colouring greyscale sprites, displaying scanned sprites at half intensity to make tracing easier, and the editing of sprite palettes.

ArtWorks 1.10 will be available in the first quarter of 1993, and is available free to all existing registered users. Upgrades can be obtained simply by contacting Computers Concepts and quoting your serial number.

Although the package comes with a number of discs of high-quality artwork, Computer Concepts is keen to expand the library to cover all kinds of topics/areas. Similar programs on other computers have vast libraries of clip-art supplied on CD-Rom.

An *ArtWorks* clip-art competition has therefore been launched by Computer Concepts to increase its library. Any drawings can be entered, providing that they have been done using *ArtWorks*, and they are original works. There is no limit to the number of entries per person.

The closing date is 30 April 1993, after which a panel of judges will decide on the winners, taking into account creativity, imagination and technical skill.

The first prize winner will receive a top-of-the-range Canon BJC800; a 360dpi, A3, inkjet colour printer worth more than £1800. Further prizes of £100 vouchers redeemable against Computer Concepts products will go to the runners-up and £10 vouchers will go to anyone whose drawing is chosen for inclusion in the library.

For further information on *ArtWorks* and entry forms for the competition, contact Computer Concepts Ltd, Gaddesden Place, Hemel Hempstead, Herts HP2 6EX. Tel: (0442) 63933.

X-RAY SPEX

HAVE you ever wanted the chance to try your hand at a bit of interior design, or to recreate your favourite Roman ruin? Well now you can, courtesy of *Spex* from ExpLAN.

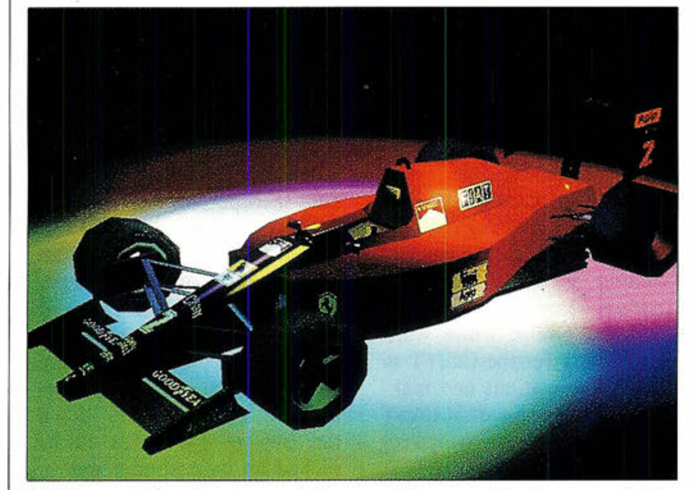
Spex is billed as 3D Environment Design Software, and it allows you to place predrawn items on a plan view of a room which is projected as an isometric perspective.

The basic *Spex* package comes with graphics for four types of room; kitchen, bathroom, bedroom, and lounge. Additional discs will include such topics as gardens, theatres and classrooms. A special developers' pack will also be released.

Spex will be released in Spring '93 and will retail at £89.95+VAT for secondary schools and £49.95+VAT for primary schools. Both packages include a site licence.

Further details on *Spex* can be obtained from ExpLAN on (0822) 613868.

PICTURE OF THE MONTH



THIS month's prize artwork is a rather stunning picture of a Formula One racing car – Nigel Mansell's old Ferrari, in fact – and it just goes to show what sort of results you can get out of art packages with a little time and patience.

The car was created by Mark Skilling from Tunbridge Wells, using the ever-popular *Illusionist* from Clares, and it makes excellent use of the mapping facility that allows the user to wrap two-dimensional sprites on to solid objects.

All the logos and graphics on the car were drawn using *Revelation* and were then imported into *Illusionist*. The final image was then rendered in Mode 28 to ensure that the dithering looked effective.

NEWS IN BRIEF

● 4Mation has refined its *Noot* graphics system to allow the package to animate anti-aliased *Draw* files.

The first program to make use of this feature is the long-awaited 32-bit version of *Granny's Garden*, one of the most popular educational programs for the original BBC micro.

Future versions of *Noot* will incorporate the anti-aliased animation, and further products that make use of it will be launched soon by 4Mation. Further details can be obtained from 4Mation, 14 Castle Park Road, Barnstaple, Devon EX32 8PA. Tel: (0271) 25353.

● Because I get a lot of pictures from *Illusionist* users (see this month's prize-winning picture), I thought it might be useful to carry out a small survey as to what readers consider to be their favourite art package on the Archimedes.

Obviously, some programs cover areas that others don't, such as *Euclid* against *ArtWorks*, but it would be interesting to see what comes out on top.

If you're a hardened *ProArtisan* user or even a dedicated *Paint* fan, please let me know. A chart of the top 10 packages will appear in this column soon, so get voting now. Send your votes to the usual address or via the Arcade bulletin board (user no. 1144).

● Send in your ideas, news or graphics. You can contact the Graphics Page by writing to: Rob Miller, The Graphics Page, BBC Acorn User, 101 Bayham Street, London NW1 0AG, or by modem via Arcade BBS user #1144. Arcade is on 081-654 2212 or 081-655 4412.

If you are using Arcade, please keep your communications to just messages. Any large files such as pictures should be sent on disc to the *BBC Acorn User* address above.

Don't let that dissuade you from sending in graphics, though; you can win a valuable cash prize. This month's picture is from Mark Skilling, 64 The Ridgeway, Southborough, Tunbridge Wells, Kent TN4 0AE, who will be receiving £10.

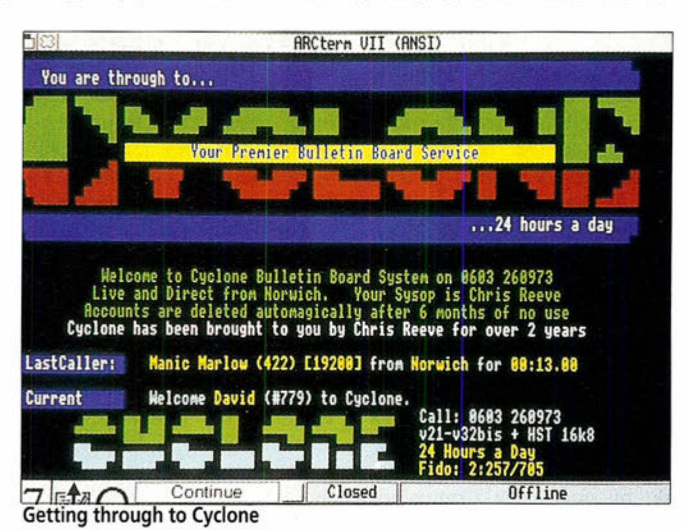


FRIENDLY CYCLONE HITS NORWICH

NORWICH is a fine city, interesting not only for its atmosphere and architecture, but also for its several Archimedes bulletin boards. Cyclone BBS, run by Chris Reeve, started out in 1989 and ran for two years on a BBC Master before Chris met up with programmer Keith Marlow and was introduced to the Archimedes.

Keith develops BBS software for the Archimedes, and Chris has let Cyclone become a willing test-bed. Cyclone now runs on an A3000 with a 100Mb hard disc and USR dual-standard 16k8 HST modem. Keith Marlow's BBS software is called *Archiboard*, now available commercially.

Cyclone offers a number of special interest areas, including a radio and TV magazine area called MegaHertz. This caters for enthusiasts in domestic broadcast output and hospital radio with a news and information section. There's also a section for amateur radio operators and scanner owners. Satellite broadcasting and many other topics varying from packet radio to jokes are covered in the FidoNet message areas.



Getting through to Cyclone

Cyclone has an Acorn Support Area, and is connected to most of the FidoNet Archimedes message echoes. There are 12 Archimedes and four BBC file download areas. Cyclone is not currently sponsored or supported by any commercial interests, so regular users are invited to make a donation. This is certainly worthwhile, since even a donation of just £5 each from 20 users will pay the phone bill for a year.

Cyclone BBS is online 24 hours a day on (0603) 260973 at speeds from v21-v32bis and 16k8HST 8N1.

TERBO WARS HOT UP

SOME modem manufacturers are getting understandably impatient waiting for the CCITT to come to a decision and ratify the forthcoming V.FAST high speed PSTN standard. The technology for the expected speed of 28,800bps duplex is tested, ready and waiting.

In the meantime, a consortium of 18 companies including Dataflex, Multitech and Nokia are planning to introduce an interim 'standard' running at 19,200bps, which the consortium is calling 'V.32terbo' (sic).

This 'jumping-the-gun' is exactly what has happened in previous cases when decisions on lower speed standards were still to be finalised by the CCITT.

Although it may seem chancy to go forward with a standard that may need to be changed at the last minute, the design of modern hardware usually means that it is mostly the operating software that determines how the new standard will operate in practice.

Some manufacturers, Multitech for example, are already offering firmware upgrades that you can simply download from the company's support bulletin board and immediately install using flash memory technology.

Other modem industry players are refusing to be swayed by all the hype surrounding V.FAST. They are ignoring letters from the V.32terbo group, while waiting patiently for the CCITT to end its deliberations and making sure they have V.FAST products ready in the wings for instant release.

US Robotics has said that the newest dual-standard Courier modem will be upgradable to V.FAST. While dismissing the V.32terbo group as a sideshow, the company has nevertheless announced its own proprietary high-speed standard, called HSTbis which will itself run at 28,800bps. Let the battle commence!

VIDEO STAR

British Telecom's new Relate 2000 videophone was shown at the BETT show, and offers the user full-motion video and sound over a normal telephone line at standard phone charges.

The BT videophone looks much like a standard phone, but incorporates a compact fold-down 3in colour LCD screen and CCD camera. The picture moves at 10 frames per second, and by the use of clever coding and compression, both voice and picture signals are transmitted in Marconi M-VTS standard down the line at 14,400bps to be picked up by a similar unit at the other end.

The transmission of pictures is entirely optional, as calls always start out as voice-only, and the telephone can be used in the normal way with all the usual tone-dialling features.

So how long will it take before we are making calls to a videophone bulletin board? Remember, you saw it first in *Acorn User*.

NEWS IN BRIEF

● Lanark BBS, recently opened by sysop John Wilson at Earnock High School in Hamilton, has been set up to support education users in the Strathclyde area.

John is especially keen to feature file downloads of programs and material for the BBC micro family. Lanark runs ARCbbs software on an A5000 with internal 40Mb IDE disc and an external SCSI 105Mb hard drive.

The A5000 will form part of the school's Nexus and Econet networks. Lanark BBS is part of the FidoNet system at node 2:259/44 and runs 24 hours a day at speeds from 300 to 14,400 bps V42bis 8N1 on (0698) 285838.

● MicroFido is the name coined by developer Paul Welbank for his easy-to-set-up school FidoNet kit. The Fido-on-a-floppy PD software package enables any school to participate in the extensive SchoolNet messaging system with a minimum of equipment; an Acorn 32-bit computer with floppy drive, serial port and modem.

Full details of the package can be obtained by logging on to StarNet, the Host system at Eaton School, on (0603) 507216 8N1 300-2400, or by writing to Paul at: Eaton School, Eaton Road, Norwich NR4 6PP.

● Pace Micro Communications has announced its top-of-range modem, the Linnet 32Plus. As the name suggests, it supports data rates from V21 (300bps) to V32bis (14,400bps) including the V23 (1200/75bps) Viewdata standard.

The Linnet 32Plus also features V42 error correction, with both V42bis and MNP5 data compression, and a system of built-in help pages. The retail price of £499 + VAT makes the BABT-approved Pace Linnet 32Plus very good value, and the company may be willing to consider discounts to sysops. Look out, US Robotics . . .

● YOU can contact me with any news or information you'd like to be included by writing to: David Dade, BBC Acorn User, 101 Bayham Street, London NW1 0AG or get in contact by modem on Arcade BBS, User #2 – 081-654 2212 or 081-655 4412

Quality Reliability Performance Quality

ULTIMATE EXPANSION SYSTEM

Laser Express MicroPodule

The Laser Express MicroPodule is the latest product in the Ultimate Expansion System.

Laser Express is a direct drive laser printer controller for the Canon LBP-4.

Laser Express, as with other direct drive laser printer cards, gives fast and efficient control of the Canon LBP-4 at up to 600DPI.

Laser Express, unlike other Direct drive laser printer cards, is in the form of a MicroPodule. When used in conjunction with the Ultimate MultiPodule it is the only direct drive laser printer card for the new Acorn range. (A3010/A3020/A4000)

Price £249.00

Deliveries start April 1993

HiVISION digitiser

HiVision is a real time 508 line colour video digitiser which, using Vision's advanced technology, produces high resolution monochrome and colour sprites. All existing Vision users can upgrade their Mono or Colour digitisers to HiVision. Please telephone with Vision serial number for upgrade cost. HiVision is now also available as a MicroPodule for the Ultimate Expansion System. Free HiVision Demo Discs are available on request from HCCS.



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INTRODUCING THE NEW

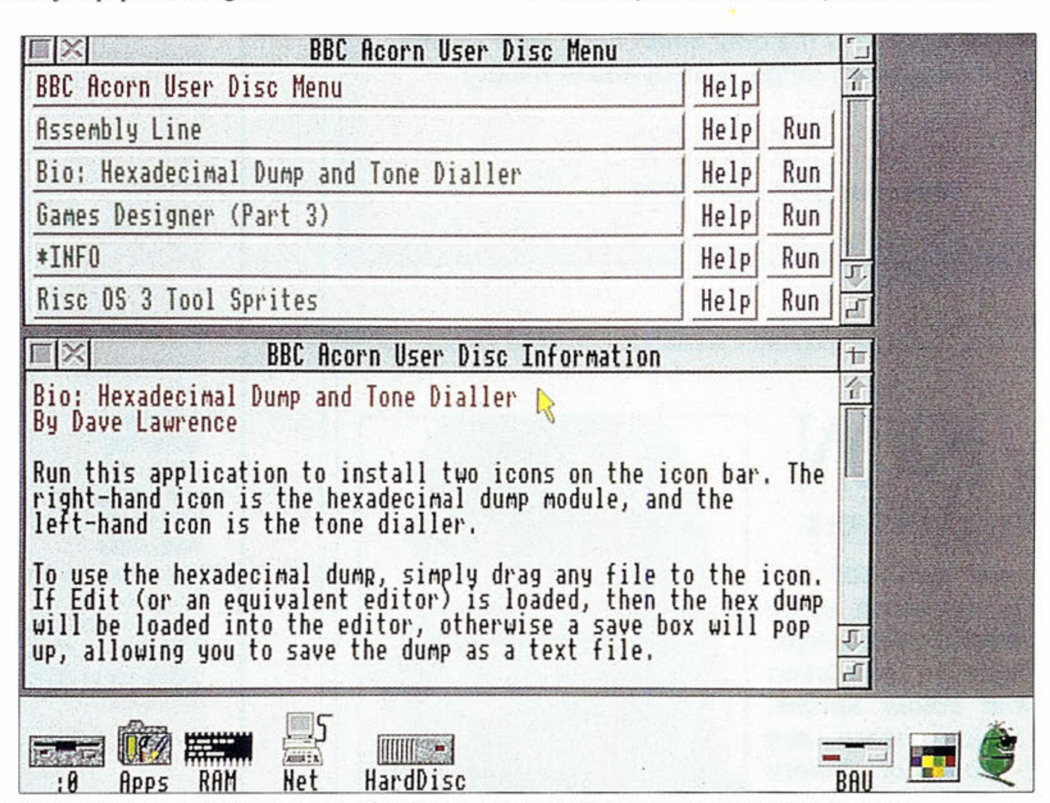
The Acorn User magazine disc: it's not just a pretty face,

The *Acorn User* disc is dead! Long live the *Acorn User* disc! As from this month, the 3.5in *Acorn User* magazine disc is different. Gone is the old combined Compact and Archimedes disc: there's now a disc exclusively for each machine. And they're still totally free to subscribers.

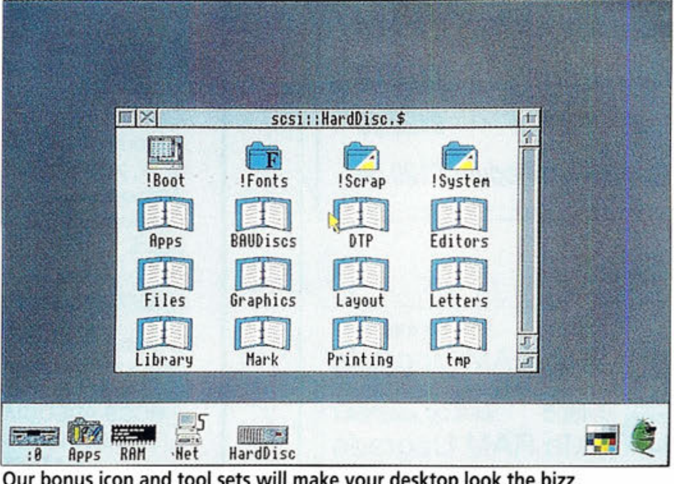
On the Archimedes disc there's now an easy-to-use multi-tasking menu program, which displays helpful advice for everything on the disc. Take too long to understand your magazine disc? Now you can just pop it in and go . . .

All the programs from the yellow pages are included on the disc, along with instructions for use. And, to cap it all, there are bonus programs and surprise extras every month.

● To subscribe to BBC Acorn User and receive your free magazine disc, complete the form opposite and send it with your payment to Acorn User, 5 Westminster Court, Hipley Street, Old Woking, Surrey GU24 9LG, or ring (0483) 727762. You can also order back issues and magazine binders, to hold a whole year's issues, using the same form.



No more messing around with complicated directory structures: it's the disc menu to end all disc menus



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THE MASTER COMPACT

Calling all Compact owners! The 3.5in magazine disc is now formatted using Archimedes E format and, as a result, will no longer work on your machine. To ensure that you receive the Master Compact version of the magazine disc, every month, please send your address details to:

Master Compact Disc
BBC Acorn User
Redwood Publishing
101 Bayham Street
London NW1 0AG
Tel: 071-331 8000

ACORN USER DISC

it's also an indispensible companion to your favourite Acorn magazine

DISC CONTENTS

THE ACORN USER DISC MENU

Exceptionally easy to use, this multitasking disc menu system makes it child's play to get the best from the new look *Acorn User* magazine disc.

ASSEMBLY LINE

All the programs from our Assembly Line feature on page 85 which, this month, takes a look at recursion in Arm code. There are five programs in all; two Basic programs and their Arm code equivalents, and a macro to aid in debugging your own source code.

BIO LOGICALLY

The complete and ready-to-run *Bio* application, with two new modules. *HexDump* creates hexadecimal dumps of files, while *ToneDial* allows you to dial numbers from the desktop down your phone; look, no hands! *Bio* is *Acorn User*'s own modular file processing system, which we will be adding to on a regular basis. See page 79 for more details.

MOVING TARGETS

This month the games designer suite expands into new realms with an enhanced alien movement editor and a complete landscape scenery editor. All the editors presented so far are included on the disc, along with the data files necessary to run them. Next month the series will reach a climax, with a complete game for you to play and understand. Turn to page 82 for this month's inStallment

*INFO

A veritable bubbling pot of variety and originality, combining strange attractors and wacky one-liners with seriously useful applications. Full details of all these programs found on page 69. Astound your friends! Amaze your relatives! And all at the click of a mouse button . . .

DESKTOP TOOL ICONS

It's Big Bonus time: 19 sets of tool icons for customising the appearance of your desktop windows, ranging from the beautiful to the downright peculiar; six sets of icon sprites for altering – among other things – the icon bar; and two backdrop sprites for making your Pinboard that little bit more interesting. These are guaranteed to contain something for everyone, they're great fun, and they're all free!

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FOUR OF A KIND

We check out four of the best new Acorn products, including the kit that lets you make Replay movies yourself

In the days when radio was still wireless and schools had pianos in the assembly hall, audio-visual sophistication usually meant a scratchy roll of slides and a tape-recorded commentary.

Times have changed. Most secondary schools now own video equipment and may even have a sound studio, and there is a wish to integrate this resource with their computer hardware. Acorn, Apple and Microsoft have all responded with different ways of showing motion video on a computer screen, each aiming for a different cost and quality level.

Replay is Acorn's method for displaying digitised motion video in a Risc OS window. It lets you integrate live action and computer graphics, text and sound in a business presentation, a classroom project or multimedia application.

Hitherto, creating a Replay movie required you to send off your video to a bureau, which digitised and compressed it for a fee of around £100 per minute of video. Now, with two Replay DIY products, you really can do it yourself.

Creating your own Replay movie is a four-stage process. First comes the filming; grab the camcorder and off you go. Then you capture the video on to hard disc, using the Irlam digitiser. Next, with Uniqueway's *Empire* software, the digitised video is edited down.

Finally, the edited 'film' is compressed into a Replay file using Acorn's 'moving lines' software. It can be viewed with the usual *ARPlayer* front end, or incorporated into something like a *Magpie* or *Genesis* presentation.

Each of the clips can be filmed separately and edited together later. All you need is an ordinary camcorder.

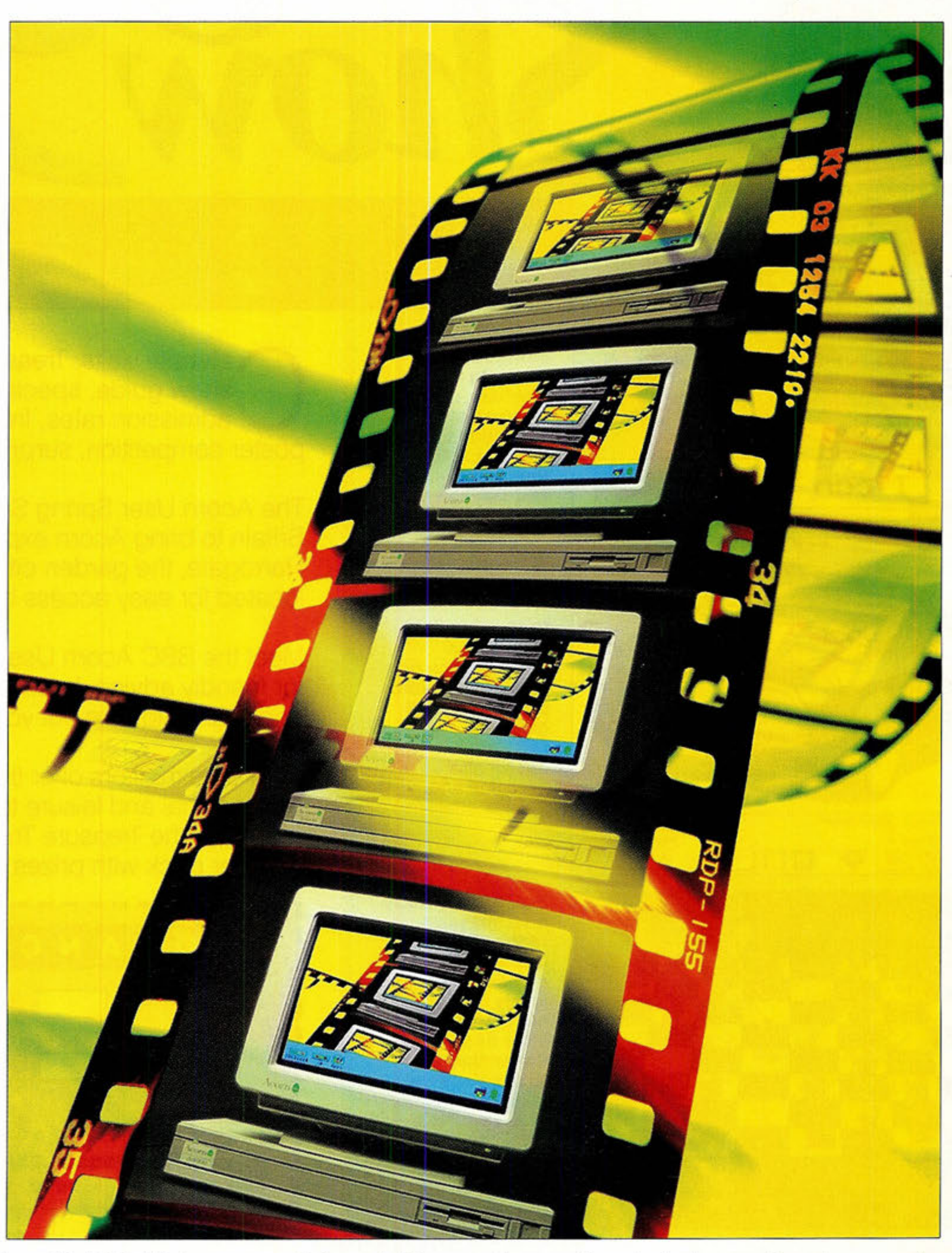


Photo: ROBERT CLIFFORD / Ill: GEORGE SNOW

IRLAM'S REPLAY DIY

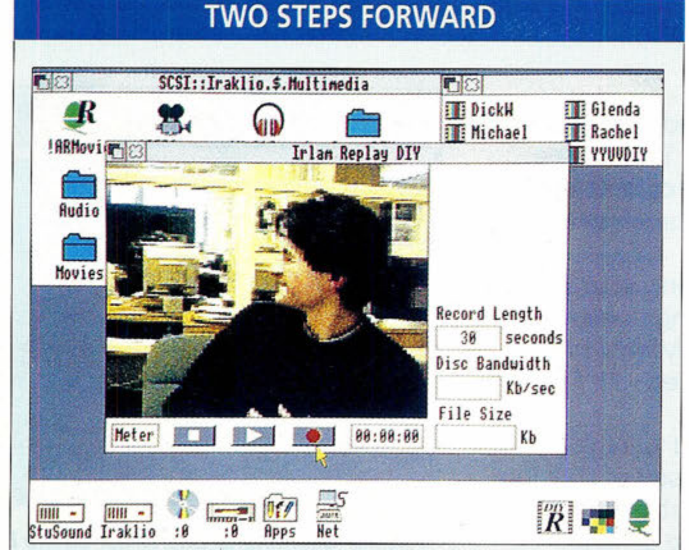
The Irlam Replay DIY expansion card is a standard, single-width podule which fits in the normal way to any A5000 or A540 with 2Mb or more of memory. Only these are certain to work, since they have the requisite speed that earlier Arcs, the A400 and A300-series machines, lack, even when upgraded to an Arm3. The latest family of Arm250 machines, the A3010, A3020 and A4000, fall short on speed and don't have the standard podule interface either.

The podule is neatly built, and, along the back, has only a BNC connector for video input plus two phono sockets for sound. Once the card is fitted, capturing your filmed scenes on the computer is straightforward. You put the tape from the camcorder into your video recorder, and connect the video recorder up to the card using the usual PAL aerial output. You can also connect cameras directly, or get video images from Laservision disc.

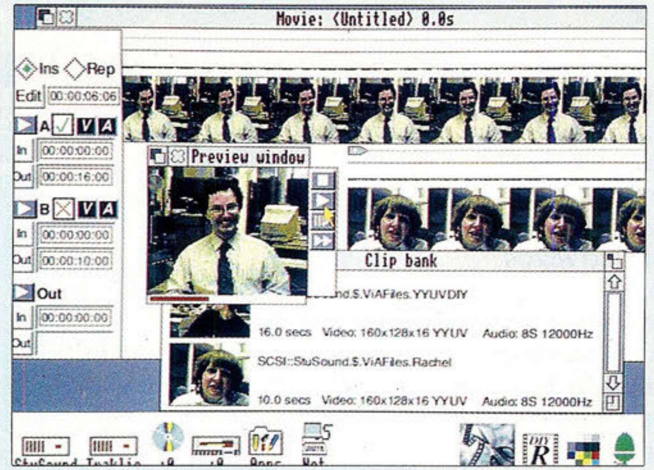
The Irlam *ReplayDIY* application software runs on the desktop, and produces a window on screen in which you can see your video. This preview is of lowish quality, but it is quite good enough to confirm that you have the right bit of tape, and to cue up what you want to capture.

You can specify how many seconds of the scene you want,

TWO STEPS FORWARD



Once the video camera is plugged into the Replay board, the computer can record a video sequence. Then, when recording has finished, the clip can be played back, complete with the sound track.



Sequences are edited using the *Empire* package. Films can be shown frame-by-frame, and sections are cut and pasted to create the final movie. *Empire*'s ability to show a sequence of individual frames, as if you were looking at a genuine film, is invaluable.

then play it and press the Record button on screen. During recording there is no picture: the hardware on the card captures and digitises the picture and sound data, then it is transferred to the Arc's memory and stored on hard disc 'on the fly'. So the length of video clip you capture isn't limited by the amount of memory you have: all you need is a huge hard disc.

At this stage the data is uncompressed and stored in a new type of VIA file (Video Interleaved with Audio), taking up about 21Mb per minute of video. The quality equates to normal Arm2 Replay, that is 256-colour, 160×128 pixels at 12.5 frames per second.

The Irlam software also allows you to view previously captured VIA files on screen, and to record and preview sound-only files.

It is likely that a software upgrade will allow 25fps capture in the near future. A separate mini-DIN connector can be added to the card for S-VHS input. This hardware upgrade should offer slightly higher video quality, but will only be useful if your camcorder or video recorder has a direct S-VHS output.

EDITING

The unexpected bonus of the Replay system is editing. Uniqueway's *Empire* application allows you to perform basic video editing functions on uncompressed VIA files.

The application opens three windows on screen. The 'clip bank' is rather similar to a filer window, in that it shows the details of any VIA file video clips you select, with a single frame showing the video clip.

The second window shows three movie 'tracks', laid out horizontally like strips of photographic film. The top two are drawn from the clip bank, the bottom is the edited version. You can pick start points (in-cues) and end points (out-cues) for each track, and cut from one track to another at any point, just by dragging around the strips of film, or by dragging cue markers, or by typing in time codes. It is impressively easy.

The third window has video recorder-style control buttons, and can be used to show a video preview of any of the clips, or of the edited version.

Once you've set up your sequence of edits, *Empire* assembles a fully-edited VIA file by copying and joining up sections of your clip bank files in the way you specify. It doesn't destroy the originals, so you can use the same clip over and over again, or re-edit the whole work.

Even this basic editing capability opens up the possibility of making longer and very professional-looking Replay movies, or of compiling a library of video clip-art resources, and so on.

There are as yet no effects, dissolves or wipes available to make a transition from one shot to another. But the software 'hooks' are in place, and special effects are likely to be added as an option in future. It doesn't rival Adobe's *Premiere* for functionality, but neither does it cost £500.

COMPRESSION

While VIA files require over 20Mb of hard disc space for every minute of captured video, Replay movie files take up about 4 to 5Mb of disc space per minute. Previously, the movies had to be compressed at a service bureau such as Uniqueway. But with DIY Replay, you can do this yourself: Acorn's own compression software will be supplied to convert VIA files into Replay ARMovie files.

Movies work on any Risc OS machine, not just Arm3 machines. But the compression scheme is asymmetric. Decompression is super-fast, so movies can be loaded and displayed in real time, even from slow media like CD-Roms, and compressing the data is relatively slow. It takes a few minutes for every few seconds of video.

Most Replay clips will total only a few seconds, and could compress in a couple of minutes on a fast Archimedes. But luckily, if you have a long movie to compress, this is a 'fire and forget' operation that can be left running overnight.

Once you've edited together your sequence of clips and created the composite VIA file with *Empire*, you can preview the whole thing within either *ReplayDIY* or *Empire*, then set the compressor going.

Your completed ARMovie file can be played with Acorn's bare-bones *ARPlayer* application, or incorporated into a more ambitious presentation using the Replay-capable versions of *Magpie* or *Genesis*.

Replay DIY should spark ideas in the most jaded student. The whole process is simple and exciting, particularly since it is so immediate. Capturing a few short video clips, editing and putting them into a *Magpie* binder could take less than an afternoon, and without doubt will generate and maintain immense interest in the classroom, or even at home.

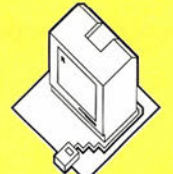
The potential market for *ReplayDIY*, *Empire* and any related products is vast, for the most surprising thing of all is the low cost: Irlam's digitiser card is £250+VAT and the *Empire* editing software is only £75+VAT. Another £50 buys a director's chair from Habitat, and you're ready for 'Action!'

Graham Bell

PRODUCT DETAILS

Product: Replay DIY/Empire
Supplier: Uniqueway/Irlam Instruments, 42 Crwys Road, Cardiff CF2 4NN
Tel: (0222) 644611
Price: Replay DIY – £250
Empire – £75

Product: Director's chair
Supplier: Habitat
Price: circa £50



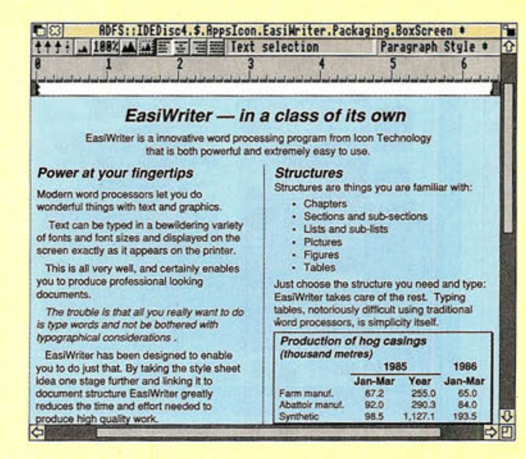
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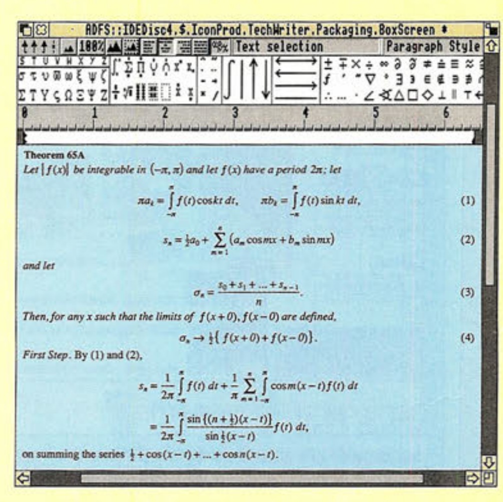


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Archimedes World



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Graham Bell, Acorn User



StartWrite

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Features: Word processor, database, spreadsheet, mailmerge, charting

Advance is Acorn's new integrated business application: a word processor, spreadsheet, database and graph drawing utility, all in one application.

On the Mac, Apple's *ClarisWorks* integrated package became a best seller. Can *Advance* do the same on the Archimedes?

Advance needs Risc OS 3.1, and is certainly happier with 2Mb or 4Mb than one. It has to be carefully installed, particularly on a floppy disc system. And with the domestic-grade *Advance*, installation is an irrevocable step: the master disc is keyed permanently to a single Archimedes. For schools though, there is a site-licence scheme, as well as special off-site discs that can be un-installed and transferred to another machine.

Word processing includes a mailmerge feature

Once *Advance* is safely installed, double-clicking puts *Advance's* desk icon at the foot of the screen. This gives access to its four component modules: word processor, spreadsheet, database manager and graphing utility.

THE MODULES

The word processor is based on Computer Concepts' *Impression Junior*, though with a number of significant changes. One immediately noticeable casualty is CC's 3D-look, ditched in favour of a flat, rather bare approach throughout *Advance*. Anyone used to *Impression* itself will also miss the styles and the ability to create frames, and be surprised to see documents stored as files, not as directories. But the essentials of the original remain: word processing with control over typeface, size and other attributes; an as-you-type spelling checker; graphics embedded in the text; and a simple way of setting up single or multi-column page layouts without the bother of master pages.

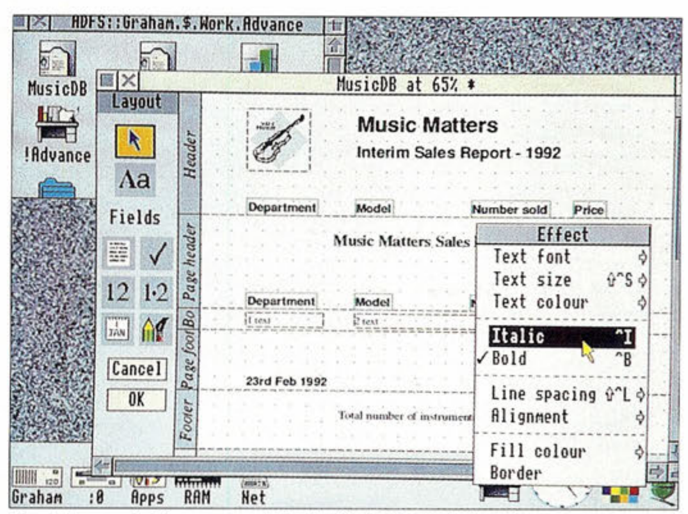
Advance's spreadsheet is a cut down and redesigned version of *Schema*, which is written by CRM but marketed by Clares. As a beginners' spreadsheet, it's capable. And while it's considerably simplified from the original (the script language has gone), there are a few improvements too: editing the contents of cells is more surefooted now, and rows and columns can be fixed in place to provide a useful way of showing column or row headings. *Advance*'s database is a version of the well-regarded *DataPower*, contributed by Iota. It allows you to develop highly-graphical databases, and can store sprites and drawing files, not just text and numbers. The database designer is easy to use, and for the user that *Advance* is aimed at, it is a good choice. *AdvanceDB* is less modal than most database managers: designing reports is a trivial extension of designing original database layouts, so there is less to learn.

INTEGRATION

One of the key features a package like this must possess is integration; it has to be easy to move data from one part of the package to another.

This is best exemplified by graphing tables of numbers from the spreadsheet or the database: it is as simple as highlighting an area of the sheet and choosing a menu option. The charting module is not that of *Schema* – which was limited to 2D graphics – but is taken from *DataPower*. You can choose your graph type from a toolbox 'gallery', and directly edit text in axis labels and so on.

The other good example of integration between parts of *Advance* is the new mailmerge



The Advance database: a good choice for its intended audience

option in the word processor. A CSV file from either spreadsheet or database can be imported, and the headings from the file merged into the text: it works like *Easiwriter*, and is a big improvement on the mailmerge facilities of the *Impression Business Supplement* – Computer Concepts would be well-advised to add this to *Impression* itself.

Aside from the ability to import *Draw* files and text, that's about it. But as entry-level software, the ease of integrating data from each of the modules is paramount: beginners often expect a single application to do everything, and the Risc OS 'software toolkit' approach has to be learned. The integration isn't as seamless in *Advance* as it is with the best packages of this type – *ClarisWorks* on the Mac for example – and using *Advance* isn't much easier than using four separate packages. Indeed, on a 1Mb or 2Mb Arc, since only one or two of the modules can be loaded at once, it *is* four separate packages.

The spreadsheet is a capable beginner's tool

Acorn has made an attempt to ensure the four rather disparate applications look similar, and a number of features will smooth the path for first-time users.

LOOK AND FEEL

There are some pretty icons, rather at odds with the simple window layouts, and items like the colour picker that appear in each of the applications are consistent. *Impression*'s helpful terminology, distinguishing between effects and styles has been maintained throughout, and to aid beginners, there are Bold and Italic effects in all of the applications.

The action each takes when you close a window has been rationalised too: closing a window closes the document (after a warning), so you can't unwisely build up a list of 20 unsaved letters in memory. For the home or business beginner, *Advance* is a quick way in, and many people won't need to upgrade to grown-up versions of these applications (although don't expect upgrade deals if you *do* need to). Of course there are limitations – the modules are not as fully-featured as their parents – but look at what has been left in: spellchecking; loading of Lotus 1-2-3 files; 3D charts and so on. At just under £100, the cost is very reasonable.

This isn't a package for the committed Archimedes fan, but it's well-aimed at beginners. *Advance* is also likely to appeal to users who have only a casual interest in databases and spreadsheets.

Graham Bell

ACORN POCKET BOOK WITH A-LINK

Pocket Book: £249.95 inc VAT
A-Link: £59.95 inc VAT

Acorn's new Pocket Book has now reached the final stage of its conception, with the completion of the optional *A-Link* file transfer software.

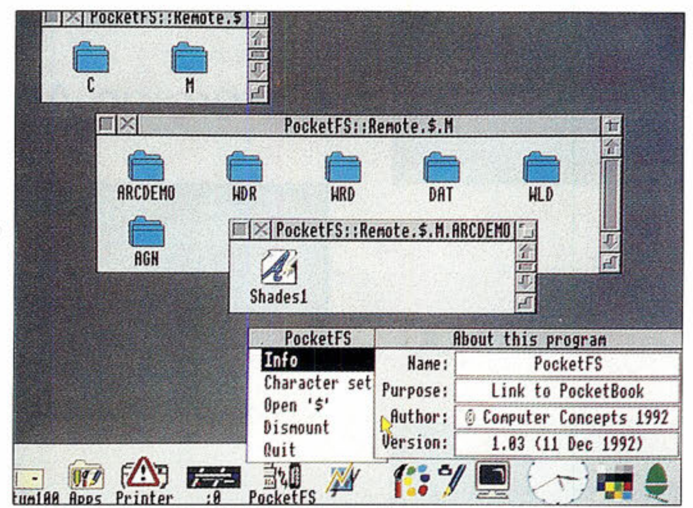
The Pocket Book is Acorn's customised version of the Psion Series 3 pocket computer. Acorn's collaboration with Psion was inspired, but how does the Pocket Book compare with the original Series 3?

Acorn is at pains to point out that the Pocket Book was devised specifically for the education sector. For this market Acorn felt a spreadsheet and spelling checker were mandatory. Built-in Series 3 applications had to be sacrificed to keep the cost down and provide Rom space for the spreadsheet.

This means Pocket Book users must do without the *Agenda* personal diary/scheduler, speaker phone dialler and OPL programming language. Even the *World Time* application failed to survive for an airing in the geography classroom. Password security options have vanished too.

The Rom space released accommodates a version of the Series 3 spreadsheet, which Acorn calls *Abacus*. This is almost identical to the Psion version, though a handful of esoteric financial functions have been left out. The spelling half of Psion's *Spelling Checker* and *Thesaurus* is included with the Pocket Book on a plug-in SSD (Solid State Disc cartridge).

The suggestion that a variant of the Series 3 would be ideal for schools is unquestionable, but it's up to teachers and their students to decide whether the Acorn formula is better for them than Psion's. Acorn counters any disappointment over the missing application, *Agenda*, by explaining that it is not much good for schools anyway. Instead, Acorn is hoping that a third-party developer will produce a more suitable school diary application that allows the use of timetables.



A-Link is a piece of superior file transfer software

Currently, only one built-in application displaced from the Series 3 is available to Pocket Book users as an upgrade option: the OPL programming language. However, most third-party software releases for the Psion are Pocket Book compatible as well. Files can be exchanged with SSDs from Psion's MC (Mobile Computer) laptop as well.

LINKING UP

Acorn is certainly on to a winner with *A-Link*. This package allows the user to link up the Pocket Book to a desktop Risc OS machine. Contracted by Acorn, *Computer Concepts* has endowed Pocket Book users with a superior file transfer system.

Like the *PClink* software for the Psion, *A-Link* comprises a two part serial interface, an Arc serial cable and the file transfer software. *A-Link* provides familiar and elegant Risc OS management of any Pocket Book files. Effectively, a Pocket Book is treated like a rather slow (9,600bps) external Arc drive, though care is needed with long Arc filenames and any open files at the Pocket Book end. In contrast, PC users have to wrestle with a very unfriendly non-graphical link program.

A-Link also provides file translation to convert *Abacus* and database files to Arc CSV format and Pocket Book WP documents to Arc text or RTF (Rich Text Format).

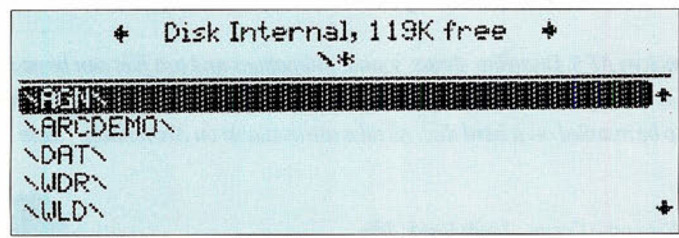
MODEM LINKS

At present, the documentation fails to mention one useful point. The *A-Link* serial interface for the Pocket Book presents itself as another Solid State Disc containing a terminal emulation. Acorn says this oversight will be corrected in the next editions of the *A-Link* manual. Despite the pocket-sized display, the terminal application works very well with a modem once you've changed the Arc lead for a modem one, but it's a pity that the top link speed is limited to 9,600bps.

The Acorn Pocket Book is certainly a compromise in favour of the education sector. For that reason it can't be recommended for non-educational users. On the other hand, general users may consider the Series 3 Psion a better buy, since the *A-Link* package can also link the Series 3 to an Archimedes, thus enhancing the versatility of your main computer.

It's a shame Acorn couldn't have badged a full-spec Series 3 for its many loyal users who have left their school days well and truly behind them.

Ian Burley



The Pocket Book comes with software on solid state disc

MULTIMEDIA

Acorn's Multimedia Expansion Unit is little more than a CD-Rom drive packaged in an A4000-style case. But in detail, it is nicely thought through.

The CD-Rom drive is a Sony CDU-561: it conforms to all the standards – CD/XA and CDI – and it is one of the new-generation multi-speed units. It can play a disc at double speed to load data faster, or slow down to play audio normally. And it is a multi-session drive as well: this is vital to the Kodak Photo-CD system Acorn will be supporting in the near future.

Pictures can be added incrementally to Photo-CDs, a second batch being added to an existing disc, but single session drives will only be able to access the first lot of photos.



There's also room inside for a second and third 5.25in half-height SCSI device. You could, for example, fit a big hard disc and a magneto-optical disc drive. On the front of the expansion unit is a standard headphone output, and a control to mix the sound output of the computer with any CD audio, a neat arrangement.

As an option, Cumana will supply a small amplifier to sit inside the box and drive normal hi-fi speakers directly. Rear connections are commendable: the usual SCSI in and out, stereo CD audio connectors and three push-switches to select the SCSI id numbers of the three drives.

The Multimedia Expansion Unit isn't a chunk of iron everyone should rush out and buy. It's £499 without a SCSI card, and doubtless you can add a multi-session CD-Rom drive for less. But its facilities are ideal for education, and it is an important 'statement of intent' from Acorn.

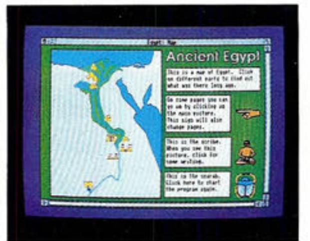
Graham Bell

Breathe life into History

Ancient Egypt £45.00

Ancient Egypt is an application to support the Supplementary study unit in History at Key Stage 2. From a map of Egypt, children can select areas of interest and explore them. The application is supplied at two reading levels. Discs of the drawfiles used and of scanned sprites are also available for use in other applications.

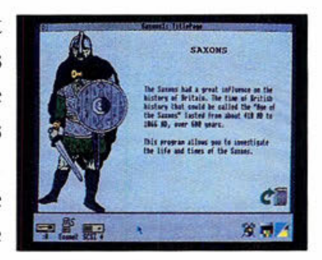
Key Stage 2



Saxon Life £45.00

Saxon Life and Viking Invaders support Key Stage 2 Core Study Unit 1, Invaders and Settlers. This application follows the history of the Saxon settlement and gives extensive details of lifestyle and beliefs. Problem solving exercises in which the children take the part of Saxon settlers are provided on a separate disc.

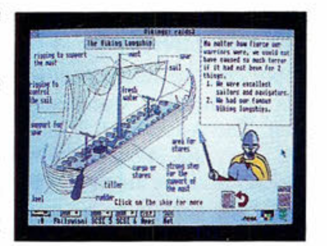
Key Stage 2



Viking Invaders £45.00

A lively and entertaining account of the impact of the Vikings on British society. Children can follow the history of the time as well as learning about lifestyles, trade, beliefs and the influence that the Vikings still have in modern times. Maps, pictures and text show how Britain formed a part of the much wider Viking world.

Key Stage 2



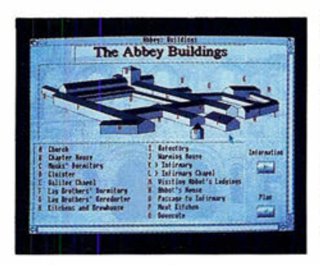
Castle Life £45.00

Castle Life is aimed at Key Stage 3, in particular CSU 2, Medieval Realms and the Castles and Cathedrals supplementary study unit. The 57 illustrated pages in this application allow children to make their own exploration of a castle, to see it as a living community and to follow its development through time.

Key Stage 3



Cistercian Abbeys £45.00



This application can be used as part of an introduction to Core Study Unit 2: Medieval Realms at Key Stage 3 or as part of a Key Stage 4 GCSE course. 75 linked pages allow exploration and investigation of the buildings of an abbey as well as examining the role of abbeys in society and developments in the mediaeval world.

Key Stage 3 & 4

Local Industry £95.00



This 500 page application explores the history and development of industry in the Sheffield area. It is structured to encourage open ended investigation of real historical data at all ability levels. Pupils can use, analyse and cross reference the materials. This is a whole school resource with relevance across the curriculum.

Key Stage 3 & 4

Battle of the Somme £95.00

(£145 with Laservision Disc)



This unique application makes use of laservision technology (even your old Domesday player!) to deliver a graphic, moving and effective teaching resource. Original film from 1916, interviews with survivors, soldiers' letters, songs, written accounts and a database make this one of the best multimedia applications available.

Key Stage 3 & 4

with Oak Solutions' History Courseware

All these applications support the three History Attainment Targets as well as Technology AT 5. Drawfiles, sprites, sound, animations and text files can be easily saved by the user and re-used in a word processor or database. Each application is accompanied by a set of photocopiable worksheets and a booklet of teacher's notes. All applications are supplied with a site licence. Local Industry is designed to be installed on a hard disc. All titles are available on Archimedes, please enquire about availability on PC platform.

Oak Solutions Ltd. Suite 25 Robin Enterprise Centre Leeds Road Idle
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PLAYING AROUND

Valuable teaching tool or just a bit of fun?
Clare Johnson examines the merits of educational games

A five year old, who had just started school, was asked what she did during her first week in class. She proudly announced that she: 'played with the computer'. Further questioning gave more information; she had been using an overlay keyboard to do some simple writing. We might not view this as 'playing' but, as with most children in the early days at school, she saw all computer activities as play.

Older children have a different view of computer 'games'. They are more familiar with fast-moving and graphically powerful arcade games, and are aware of the difference between using the computer as a tool for learning and playing computer games.

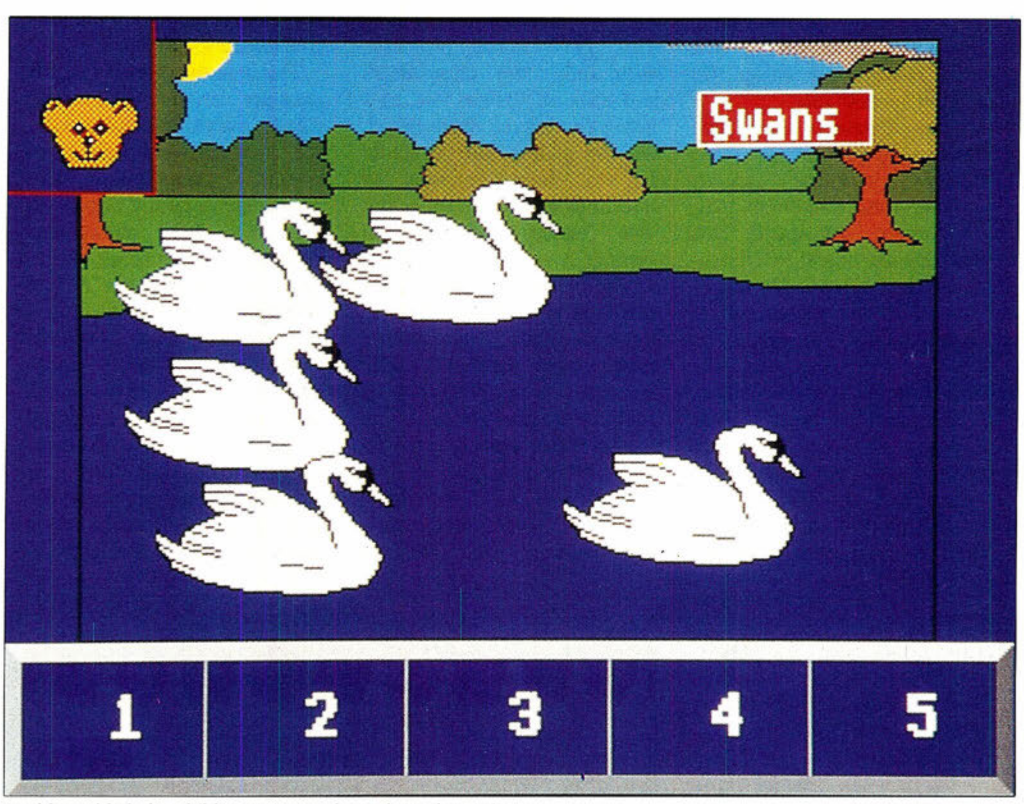
So what about the games software advertised as educational? Do children find them entertaining and, if so, then what is their educational value? To answer this question, we took a look at a selection of educational games. The software under this heading seems to fall into roughly two categories.

THE ADVENTURE

The first is adventure-type games, usually involving problem solving and moving around imaginary worlds. The problems to be solved using this type of game might be mathematical, logical or language-based, or a combination of all three. They sometimes need a good level of reading. Used in a classroom these can lead to all areas of the curriculum and may be used as a teaching theme. Some of them are simulations of real situations, such as building castles, or becoming a badger. We will look at this type of game in more detail next month.

DRILL AND PRACTICE

The second category of games is the drill and practise type which we checked out this month. These test mathematical rules, spelling, punctuation and reading, ordering, matching or memory. Many of them are advertised as needing no adult input and, in general, are cheaper than more powerful multi-purpose pieces of software. Large numbers of them are also aimed at specific areas of the National Curriculum. Teachers have certain logistical problems to solve in order to make computer games useful in a classroom. Computer time for each pupil is limited, which is not such a problem at home. As a result, teachers need games that allow them to stop and start the software very regularly, without having to go back to the beginning, so that each child gets a go . . .



Freddy Teddy helps children to swan through mathematics

There is a curricular plan for pupils, and finding a game that fits it and each individual child's needs could become expensive if the software is not flexible. The game has to be versatile enough to allow different levels of difficulty. Bear in mind that adult input is often required.

Trying the games with Peter (aged eight) and Richard (aged 12) revealed that they both became very bored when the level was too difficult and wanted the easier levels again.

In every case, the graphics on screen were a major source of pleasure to the children. They liked being told their score, and a high score table with names on it was a winner. Some of the writing was too small and, when working against the clock, this can be very frustrating for a child who does not read fluently.

All the games we tried had merits and could be used both at home and in school. Those that allow changes to levels of difficulty and flexible answering methods give better value than the more rigidly structured versions. I am less drawn to quizzes than to the testing of skills and concepts, since the answers are easily learnt and quickly lose their interest.

Finally, my thanks to the children, who tested these games for some time with very few complaints.

10/10 MATHS/ENGLISH

Triple R Education
Tel: (0742) 780370
£25.95 each

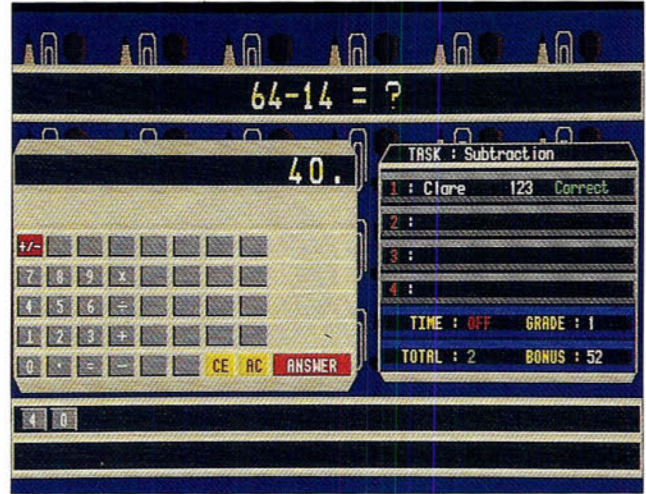
'I like what it says to me when I get it right; cool dude!'

These two packs of games, both aimed very much at the relevant National Curriculum documents, allow testing of a variety of number and language skills.

Each package has six games, all offered at six levels of difficulty, and each level tackles specific attainment targets. The explanation of which areas were being tested are very clear and the player gets a printed certificate if a target is achieved with a 100 percent success rate.

The software is very much designed in the arcade game manner: shooting targets, moving images and high quality graphics and speed. This occasionally leads to frustration if targets move too fast or slow, but these speeds can be changed and the sound can be lowered; the rewards for success were much appreciated.

The working discs can be copied, players' names entered and details saved for future use. You can have up to four players at once, and their playing order is chosen by the computer at random. This gave some problems with only two competitors and calls of: 'its not fair, he's going first again' were heard. All the games can be set to have a limited number of questions and/or the timer set. The variety of possible settings is very impressive.



10/10 tackles the National Curriculum

The first game in each pack involves shooting targets. In Peter's opinion: 'the shooting game was excellent'. The questions were presented as rules of numbers, where you had to shoot the correct answer. In the language version, the first level involved simple anagrams, then recognising abbreviations and on to rewriting sentences in the passive tense.

The next two games in each pack are varieties of the same theme; matching a question to the right answer, word synonyms, anagrams and opposites. A wrong answer in *The Big Bang* game was rewarded by a large explosion, so we did get a few wrong, because that was fun.

The Mathematics pack then offers *Silicon Brain*, a calculator simulation. We weren't sure what we were supposed to get from this that using an ordinary calculator didn't give us, apart from recording our keypresses. It would have been helpful to be able to print those out, since adult consultants aren't always immediately available.

Both packs offer a snakes-and-ladders type game with multiple choice answers and simulated dice throws. It is possible to set your own questions, but the screen layout means that you have to get very close to be able to read all the text.

The English pack also offers a library game to put books in alphabetical order. Words are down the book spine, which makes them difficult to read at speed. I never got 100 percent on this game, because I never managed to do it in the shortest number of moves. The other game, *Word Fit*, kept me amused for a long time. Not unlike *Scrabble*, words have to obey on-screen rules and are then fitted onto the board or put into a bin.

These two packages offer very good value for money, and the only quibbles are minor ones, like the inability to print out screens and questions so the players can have some practice when it isn't their turn. However, the children 'played' happily for some time, especially at the easier levels and they enjoyed their work, which is, of course, the acid test.

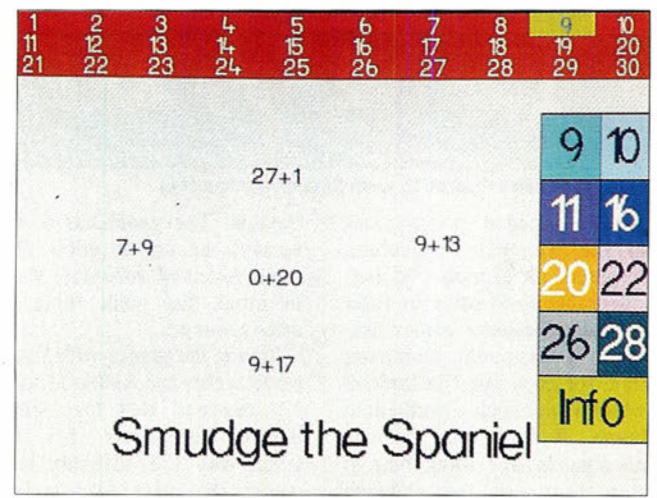
SMUDGE THE SPANIEL

Storm Educational Software
Tel: (0935) 817699
£25.99

'I like it when Smudge barks if I get it right'.

This piece of software has three activities, again testing basic skills, including number recognition. It is aimed at children from four to eight years of age, but could be used by nursery classes.

The three activities comprise *Writing Numbers*, *Dot to Dot* and *Count and Colour*. The first allows children to draw round the numbers from zero to ten using the mouse. This does involve some skill, since it is quite difficult to control the mouse. When the number has been traced, the only way to turn the pencil off is to hold the left hand mouse button down, something small children definitely find difficult. I would be nice to have a finish button of some kind.



Smudge is simple and flexible enough for the younger child

The graphics are very clear, changing the numbers is done by means of the function keys and the screen can be printed in any of the activities.

The second activity consists of classic join-the-dot puzzles on screen. Numbers up to 30 can be selected, and the dots are joined by pressing the correct number on the keyboard or by moving the pencil using the mouse. When complete, the picture can be coloured in, but the lines don't always join up so sometimes more is filled in than intended.

The third game reminds me of painting by numbers. The palette is numbered and the areas of picture to be filled have sums written on them. Get the sum right to choose the right coloured paint.

Smudge the Spaniel is simple, very easy to use and flexible. It might be too trivial for many eight year olds but is very useful for most younger children.

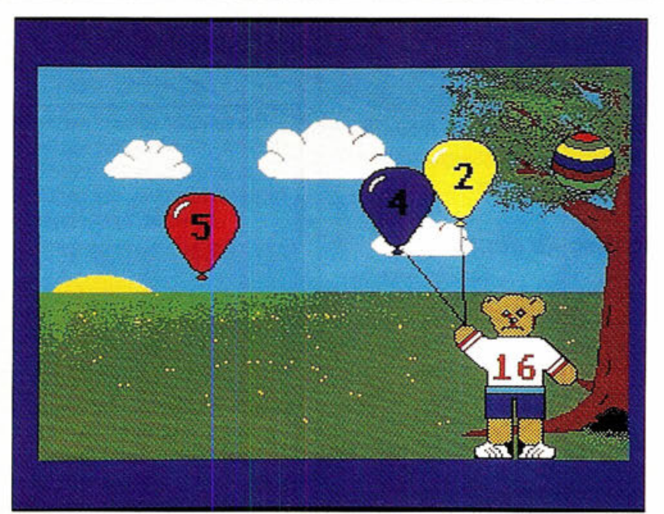
FREDDY TEDDY SERIES

Topologika Software
(0733) 244682
£19 to £20

There are a number of *Freddy Teddy* games available for young children and the latest packages to appear in the series are *Balloons*, *The Zoo*, *The Puddles* and *The Wardrobe*. In each case, Freddy is involved in some problem solving activities and they are useful for general skill building.

In *Balloons*, Freddy's ball gets stuck in the tree. His shirt has a number on it and numbered balloons float by which have to be collected until they add up to the shirt number.

Teachers can set maximum numbers, the allowed number of guesses and sequential or random presentation of the numbers.



Freddy learns to count using the balloon method

The Zoo is a simple counting test. Animals appear in a the zoo and players count them and press the required digits. Settings can also be changed to allow greater flexibilty. There is no print facility which would be nice in a classroom for display purposes, and for making extra worksheets.

The Puddle and *The Wardrobe* are both sequencing games; in *The Puddle* Freddy falls into a puddle and has to hang his clothes on the line to dry. The child has to choose the right colour for each item of clothing, but clues are given if you can't remember what he was wearing.

The Wardrobe lets Freddy get dressed correctly for four different occasions; snow, bedtime, gardening and the paddling pool. Children have to choose the correct items for Freddy in the correct order. Five out of ten possible items are presented.

Again there is no printing facility; it should be possible to provide this without much difficulty.

It seems a shame to miss it out, especially since all the *Freddy Teddy* series are easy to use, great fun to play with very young children and could form the basis for lots of curricular topic work.

FUN SCHOOL 4

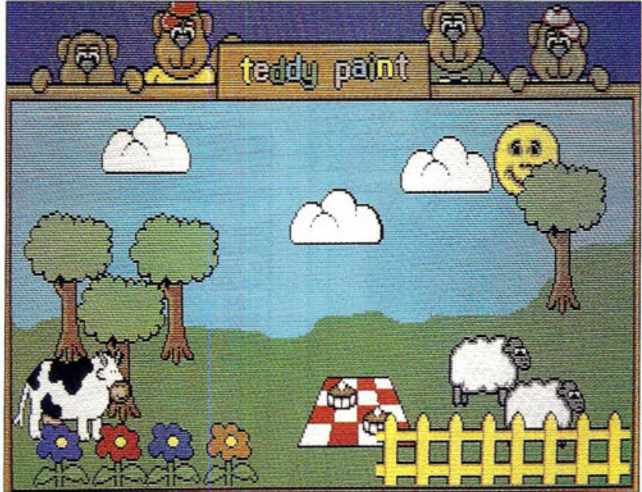
Europress Software
Tel: (0625) 859333
£18 to £20

There are two series of *Fun School* games, *Fun School 3* and *4*. They are aimed at different ability levels and each series is made up of three packs, for three age groups: under-fives, five to seven and seven to eleven. Each pack has six different games.

The example I looked at was Fun School 4, age seven to eleven, in which the games are built around a theme of espionage, and each problem has to be solved before going on to the next clue.

Agent Q has to solve the mystery of the disappearing treasure, and the story is told in the accompanying notes as well as on the computer screen. It is possible to stop and start each of the games at any stage, so that you can select your own activities. Peter was entranced by the opening graphics; Agent Q walks across the screen shining his torch. His verdict was: 'the graphics are great but some of the questions are really difficult.'

The first game is based on proportions, can be played in fraction, decimal or percentage mode, and this has three different levels of difficulty to achieve. This was the most difficult section of the package, and both children needed help with changing fractions like 8/20 to 2/5. What a nice way to introduce the ideas, though.



Funschool caters for three age groups: this one is for 5 to 7 year olds

Next, Agent Q has to solve a multiple-choice quiz, and there are four levels to achieve. Each is increasingly difficult, but you can pass up to three times on each level. You need some good general knowledge here, and there is a limit to the time you can take answering. Next it's off to the airport, first to do some foreign currency exchanges and then to buy some items that will be crucial to the mission.

There are three levels of difficulty in the game, and the rates used bear little relation to reality; but you do get to deal with different currencies and have to learn to distinguish between them.

You then have to fly off to foreign places and have to answer questions about the flight timetables before you can leave each of them. All the times are in am/pm format; perhaps the option of a 24-hour clock format would be another idea. Once again, there are increasing levels of difficulty.

Spy Travels finds Agent Q using different methods of transport, travelling round the world. An atlas is a must when playing this section, and I found it difficult on the very small screen map to achieve the accuracy required, even though I knew where the places were. I also had to try and remember that you can't sail a boat over dry land.

Finally, you reach the desert and the pyramids. Treasure is found inside the pyramids if you get the date of an historical event correct. 'I know all the answers, so it's quite easy' was the verdict here, and there was no stopping until all questions had been answered.

If I was using this in a classroom, I would like to be able to use some screens printed out as teaching aids which isn't possible, but would certainly not put me off using the software. The children enjoyed all of it but did need help with many parts, so do think carefully if you are to buy the correct game in the series for your child.

1

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Eureka	£99	Schema	£89

Business Graphics

GammaPlot	£39	Sigmaplot	£39

Integrated Packages

• Pipedream 3 £116 • Pipedream 4	£146
• Desktop Office – Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications	£98
• Desktop Folio – Wordprocessor, Desktop & Interactive Publishing. Ideal for school	£75



CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Hi-Speed, Low Cost Archi Hard Disc Drive

Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the !Fonts application.

A powerful security feature has been provided with the two unique commands *IDELock and *IDEUnlock, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELock as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

Hardware

- Single width EuroCard
- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Optional on-card 20Mb or 40Mb hard disc
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

Software

- Conforms fully to the Acorn IDE Specification
- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Up to four drives over multiple cards
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£195
ADA 0530	100Mb	16mS	£295
ADA 0570	200Mb	15mS	£449
ADA 0580	330Mb	15mS	£799

All the above 3.5" hard drives are supplied complete with Controller Card, cable & Software on ROM. (Internal fitting). For use with A300/A400/A500 series machines.

AAA 0300	External Case & PSU for A3000	£85
AEA 1060	Archi IDE Hard Disc Podule only	£89

Internal Hard Disc Drives for A3000/A3010

State of the art, 4 layer internal IDE Hard Cards for the A3000. Software supplied in, On-board ROM.

ADA 0150	20Mb	19mS	£149
ADA 0770	30Mb	19mS	£185
ADA 0750	60MB	18MS	£329
ADA 0720	80Mb	18mS	£399
ADA 0730	120Mb	16mS	£POA

Supplied ready assembled. No soldering required. Simply plug into the allotted space.

Archi IDE Hard Cards

"Simply plug and play"



Watford's easy to instal, low cost, high performance, revolutionary IDE Hard Cards for the A300 & A400 series Archimedes.

ADA 0650	20Mb	19mS	**£159**
ADA 0800	30Mb	19mS	**£185**
ADA 0660	40Mb	28mS	**£289**
ADA 0810	60Mb	18mS	**£339**
ADA 0670	80Mb	18mS	**£409**

Also available 120Mb and 180Mb Cards. Please telephone for prices. (All above Hard Cards can be used as Removable Hard Drives. Ideal for Military and Education use.)

Archimedes A300/A400 SCSI Hard Disc Offer

(while stocks last)

100MB Hard Disc Upgrade complete with Controller card, Cables, Formatter and Manuals

RRP: £799

Offer Price: £325

Also available with 16-bit controller **£359**

Low Cost Finance now available on Archimedes. Please telephone for details.

Archi to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.
New RISC OS Version also available (please specify)

- For A3000 **£15**
- For A5000 **£16**

For A3000 Serial Upgrade (**£19**) required

A3000 I/O Card (User, Analogue & IIC)

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

Features

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices. **£38**

Leasing finance at very attractive rates now available to Businesses (subject to status), Schools, Colleges, Universities, Government Depts. and Local Councils. Minimum order £1,000. Please telephone for details.

Archimedes External Disc Drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Upto 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead. **Price £21**

Back Plate Extension

- A300/400 **£15;**
- A3000 **£14**

ARM 3 Turbo Card MkII

Simply The Best



Here it is at last – the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £169. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.

Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £24.

(A300 and old A440 series owners please note – you will need to upgrade to MEMC1A for ARM3 to work.)

RRP £249

Special Offer £145

Acorn have satisfactorily evaluated Watford's ARM 3 upgrade and the A3000 upgrades are fitted by Acorn approved surface mount technology centre, therefore its fitment will not invalidate Acorn's warranty on the micro.

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheet, ADFS, BASIC Editor & TERMINAL **£329**

Add-Ons & Accessories

Econet Module for the Master	£42
Twin ROM Cartridge for Master	£9
Quad ROM Cartridge for Master	£14
Master Reference Manual I	(No VAT) £14
Master Reference Manual II	(No VAT) £14
Master Advance Ref Manual	(No VAT) £14
64K Upgrade Kit for B+	£32
ECONET Upgrade Kit for BBC B	£42
ALL ECONET UPGRADES Available	
ARIES' IEEE Interface for BBC B & Master	£238

Continued→ → → → → → → → → →

BBC Education Software

A vous la France	French programs for beginners	£29
Au restaurant/Accident de route	French games for 12 years +	£26
Bolougne and oh les	French program for beginners	£26
Computer control	Program simulating computer control	£26
Computers at work	Primary education program	£17
Espana Viva	Spanish educational programs	£20
Folks Tales	Listening and reading for ages 7+	£22
Geordie Racer	Look and read for ages 7+	£22
Hall of Mirrors	Practice word & number skills	£22
Help your child learn basic mapwork 2		£18
Inside Science	Four common science subjects	£22
Letters and pictures	Educational programs for 6-8 years	£15
Make a wildlife garden	Explore wildlife/weather/garden growth	£22
Maths with a story 1	Primary level maths programs	£20
Maths with a story 2	4 further maths programs	£20
Note invaders	Learn sheet music for 7-Adults	£15
Numbers & Pictures	Early number learning (4-6 years)	£15
Picture craft	Geometrical design & Colouring	£17
Puncman 1 & 2	Learning Punctuation (7-13 years)	£15
Puncman 3 & 4	Learning Punctuation (8-14 years)	£15
Puncman 5, 6 & 7	Learning Punctuation (8-15 years)	£15
Ramayana Tales	Simple Desktop Publisher using pictures & characters from the Ramayana	£22
Skyhunter	Look and read educational adventure	£22
Technology and design	Problem solving programs	£22
Through the dragons eye	Adventure game and Map reading	£22
Fun School 3 (Under 5)	Varied range of Education subjects	£17
Fun School 3 (5-7)	Varied range of Education subjects	£17
Fun School 3 (Over 7)	Varied range of Education subjects	£17

Archi Educational Software

- Animated Alphabet (3-6 yrs) £21
- Arcventure (8-12 yrs) £29
- Bookbinder £43
- Bumper Disc £14
- Bumper Disc 2 £14
- Craftshop 1 £26
- Craftshop 2 £26
- Converta-Key £16
- Data Word £16
- Desktop Stories £35
- DigiSim £35
- Dream Time (5-7 yrs) £23
- Farm (5-7 yrs) £19
- Fleet Street Phantom (9-13 yrs) £25
- Fun School 3 Red (up to 6 years) £17
- Fun School 3 Green (6-8 years) £17
- Fun School 3 Blue (8 years +) £17
- Gate Array Teaching System £68
- Glimpse Clip Art Utility (7-16 yrs) £8
- Highlighter (6-16 yrs) £42
- Jigsaw £28
- Mapventure (9-13 yrs) £24
- Microbugs £24
- Money Matters £16
- Nature Park Adventure (7-9 yrs) £27
- Numerator £60
- Picture Book £16
- Recall (6-13 yrs) £39
- Sellardore Tales £24
- Snippet £26
- Space Mission Mada (9-13 yrs) –
- Sting of the Dump (9-13 yrs) £22
- Target Maths £16
- Viewpoints (9-12 yrs) £33
- Wizard's Revenge (7-10 yrs) £17
- Worst Witch (7-10 yrs) £25

Archimedes Software

GRAPHICS

3D Construction Kit	£39
Arc Light	£46
ARCtist	£19
ARCticulate	£19
Art Works	£139
Atelier	£60
Artisan II	£45
Artisan Gallery	£16
Autosketch II	£65
CADet (CAD)	£140
Clip Art Set 1	£28
Clip Art Set 2	£28
Concept Designer	£23
Craftshop 1 & 2	£28
Euclid 2	£50
Graph Box	£59
Graphbox Professional	£107
HotLink Presenter	£40
Illusionist	£69
Kermit	£46
Mogul	£17
PCAD Educ.	£395
Poster	£79
Pro Artisan	£70
ProCAD	£475
Prime Art	£46
Render Bender 2	£79
Revelation 2	£80
Snippet-New	£32
Titler	£119
Tween	£29

GAMES

Air Supremacy	£17
Apocalypse	£14
Arcade 3 Compilation	£12
Battletank	£10
Black Angel	£27
Boogie Buggy	£14
Break 147 + Supa Pool	£19
Bughunter in Space	£12
Bughunter/Moondash	£10
CADet	£135
Casino	£10
Cataclysm	£19
Caverns	£10
Chess 3D	£16
Chocks Away	£27
Compendium	£32
Chocks Away Extra	£14
Chuck Rock	£18
Conqueror	£15
Corruption	£18
Cyber Chess	£38
Ego Repton 4	£–
Elite	£33
Enter the Realm	£19
E-Type Compendium	£20
E-Type Designer	£13
Family Favourites	£13
Galactic Dan	£19
Gods	£24
Grievous Bodily Arm	£19
Holed Out Designer	£13
Holed Out Golf Comp	£20
Hostages	£14
Inter Dictor 2	£26
Iron Lord	£15
Jahangir Khan Squash	£19
Jigsaw	£27
Lemmings	£20
Oh no more Lemmings	£15
Lost Temple	POA
Lotus Turbo Challenge	£19
Mad Prof Mariarti	£17
Masterbreak	£16
Man at Arms	£14
MahJong Patience	£15
Manchester United II	£19
Mig 29	£24
Nebullus	£21
Nevryon II	£20
Omar Sharif's Bridge	£23
Pandoras Box	£18
Pipe Mania	£17
Play It Again Sam	£–
Populous	£23
Puncman 1 & 2	£16
Puncman 3 & 4	£16
Pysanki	£14
Quazer	£10
Real McCoy 2	£23
Real McCoy 3	£22
Redshift	£14
Return to Doom	£16
Repton 3	£14
Saloon Cars Deluxe	£27
Sim City	£19
Spitfire Fury	£22
Splice	£25
Sporting Triangles	£24
Superior Golf	£14
Superpool + Break 147	£22
Swiv	£19
Talisman	£12
Timewatch	£24
Trivial Pursuit	£22
Twin World	£15
U.I.M.	£23
White Magic 2	£15
Worldscape	£16
XFire	£19
Zelanites	£23

Miscellaneous

Ancestry	£59
Arccomm 2	£38
Arcterm 7	£64
Armadeus Sound	£60
Avante Garde Fonts	£23
BBC DFS Reader	£6
Broadcaster Loader	£65
Chameleon	£34
Chatter	£34
Compression (CC)	£38
Craftshop 1	£27
Craftshop 2	£27
Equasor	£38
FlexiFile	£97
Genesis	£15
Genesis Plus	£68
Genesis 2	£99
Investigator 2	£22
Magpie 2	£42
Notate	£42
Numerator	£66
Pin Point	£65
Presenter 2	£29
Presenter Story	£145
Prophet Accounts	£132
Prophet Demo Disc	£10
Rainforest	£17
Revelation 2	£95
Rhapsody in Blue 2	£45
Score Draw	£46
Show Page	£127
Speech!	£15
The Victorian	£17
Time Tabler	£549
Toolkit (Clares)	£35
Touchtype	£40
Tracker	£39
Turbo Driver BJ10E	£42
Type Studio	£43
Vox Box	£46
WorldScape	£17

LANGUAGES

Desktop C	£199
Macro Assembler	£40
Robo Logo	£69
BASIC Compiler	£77
Logotron Logo	£45
Risc BASIC	£120
Risc FORTH	£110
Cambridge Pascal	£95

Minerva's Archimedes Software

EasyWord	£18
Home Accounts	£35
Time Tabler	£549
System Delta	£59
System Delta Program Reference Manual	£29

Stand alone Business Accounts Packages
Sales; Purchase; Order Processing and Invoicing; Nominal; Stock management
£79 per module
or Complete Business Package **£325**

Cortian CKAI Interface

Eliminates the need to have a User port in A3000, A5000 and any other Archimedes without User Port. Fits to the Econet socket. £29

Concept Keyboards

- A4 Standard Pack £95
- A4 Primary Pack £100
- A4 Designer Pack £110
- A3 Standard Pack £99
- A3 Primary Pack £105
- A3 Designer Pack £110
- Universal 2010 Keyboard A3 £115
- Universal 2010 Keyboard A4 £110

Archi Real-Time Digitiser



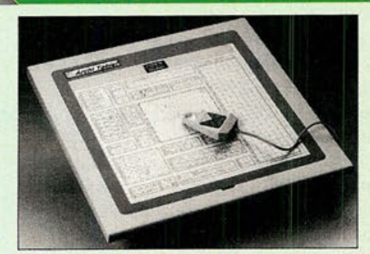
Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £99

A Set of Colour Filters for colour image grabbing using a video camera £16

Archi Graphic Tablet



Special Price £199

(Price includes Tablet, Leads, Software & Puck)
Stylus Optional Extra **£20**

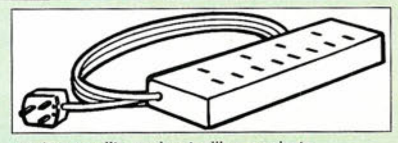
Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus **£105**

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage translent spikes/surges caused by lightning or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets.
Supplied wired up with mains plug ready for use.
Can be screwed to floor or wall if required.
Very useful for tidying up all the mains leads from your peripherals.

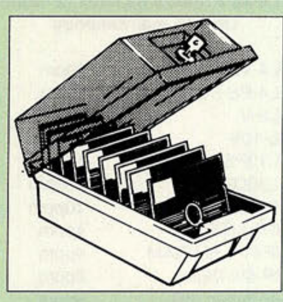
£9.50

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£16

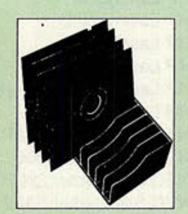
Antistatic Lockable Disc Storage Units



- **M35** – holds up to 50 5.25" discs £4.95
- **M85** – holds up to 95 5.25" discs £6.95
- **M25*** – holds up to 25 3.5" discs £4.95
- **M50** – holds 50 3.5" discs £6.50
- **M100** – holds 100 3.5" discs £6.99
- **M10** – holds 8 of No. 10 Data Cartridges £15

* Not lockable

Disc Plonker Rack



When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: £2



3M – Diskettes

Lifetime warranty on 3M Discs

- *10 x 5.25" S/S D/D 40T (744)* £5
- *10 x 5.25" D/S D/D 40T (745)* £5
- *10 x 5.25" S/S D/D 80 Track (746)* £6
- *10 x 5.25" D/S D/D 80 Track (747)* £7
- *10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT* £8
- *10 x 3.5" S/S D/D 40/80 Track* £6
- *10 x 3.5" D/S D/D 40/80 Track* £6
- *10 x 3.5" Double Sided High Density* £10



Top Quality Diskettes

Watford's life time guaranteed disc are supplied complete with self stick labels & plastic library case.

- *10 x **M3** 3.5" D/S D/D 80 Track* £6
- *10 x **M9** 3.5" D/S High Density* £10
- *10 x **M4** 5.25" S/S D/D 40 Track* £5
- *10 x **M5** 5.25" D/S D/D 40 Track* £5
- *10 x **M7** 5.25" D/S D/D 80 Track* £6
- *10 x **M8** 5.25" D/S H/D Hi-Density* £9
- ***M2** 3" Double Sided* £2.50 each

Special Bulk Offer Discs

(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
• Without Sleeves 5.25"	£25	£30	£35
• With Sleeves 5.25"	£28	£33	£38
• 3.5" D/S D/D	£21 for 50	£39 for 100	
• 3.5" D/S H/D	£40 for 50	£75 for 100	

3.5" Disc Drive

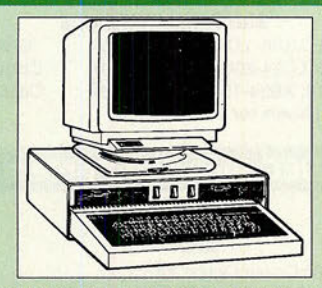


These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
	Disc Drive without PSU	
• **CLS35:**	Single Disc Drive, 400K	£59
• **CLD35:**	Twin Disc Drives, 800K	£109
	Disc Drive with PSU	
• **CS35:**	Single Disc Drive, 400K	£82
• **CD35:**	Twin Disc Drives, 800K	£126

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drives in Monitor Stand



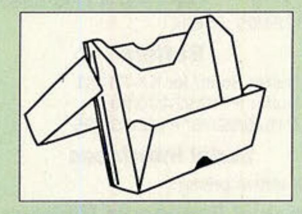
• **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£165

• **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

£154

Plastic Library Cases



- **DLC1** – Holds 5 x 3.5" Discs. £1.50
- **DLC2** – Holds 10 x 3.5" Discs. £1.90
- **DLC3** – Holds 5 x 5.25" Discs. £1.60
- **DLC4** – Holds 10 x 5.25" Discs. £2.00

Disc Albums

Attractively finished in leather-look PVC Vinyl

- **DW1** – Holds 6 x 3.5" Discs £2.50
- **DW2** – Holds 6 x 5.25" Discs £3.00
- **DW3** – Holds 20 x 5.25" Discs £3.50
- **DW4** – Holds 40 x 3.5" Discs or 5.25" Discs £4.50

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Acorn & Watford DFSs

- Watford sophisticated DFS ROM £16.00
- Watford DFS Kit complete £49.00
- DFS Manual (comprehensive) £6.95
- Acorn DNFS ROM £17.00
- Acorn ADFS ROM only £25.00
- Acorn 1772 DFS ROM Kit £49.00
- Acorn DFS Kit complete £48

Watford's MkII 1772

Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1772 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1772 DFS, plus many more added features.

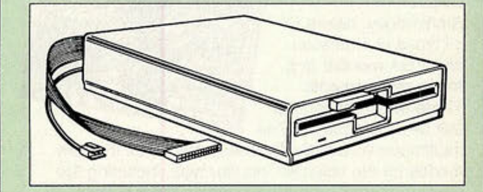
- Complete Kit Special Price **£44**
- DDFS Manual (No VAT) **£6.95**
- We will exchange your existing DFS Kit for our sophisticated DDFS for only **£26**

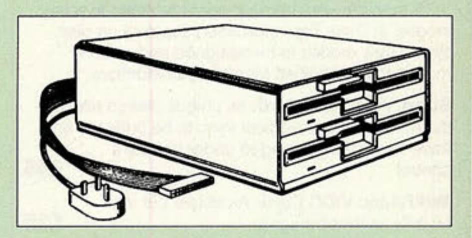
Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

"Test Bureau Approved for Use in Education"





Our Disc Drives conform to BS415

Type	Description	
	Disc Drive without PSU	
• **CLS400S:**	Single, 40/80 track 400K Double sided Drive	**£70**
• **CLD800S:**	Twin, 40/80 track, 800K Double sided Drives	**£138**
	Disc Drive with PSU	
• **CS400S:**	Single, 40/80 track, 400K Double sided Drive	**£80**
• **CD800S:**	Twin, 40/80 track, 800K Double sided Drives	**£149**

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Continued→ → → → → → → → → →

Microvitec Monitors

• **1431** – Standard Resolution Monitor	#£169
• **1451** – Medium Resolution Monitor	#£209
• **Cub3000** Med Res for A3000	#£189
• Dust Cover for Microvitecs	£5.50
• **Touchtec 501 Touch Screen**	£239
• **Touchtec 3000**	£–

Includes 3 years parts & labour warranty

Multiscan Colour

• Eizo F550i	£726	• Taxan 787	£225
• Eizo T560iT	£1319	• Taxan 787LR	£245
• Eizo T660i-T 20"	£1615	• Taxan 795PC	£415
• NEC 3FG	£345	• Taxan 875	£715
• NEC 4FG	£442	• Taxan 875+	£745
• NEC 5FG	£823	• Taxan 970	£1195
• NEC 6FG	£1485	• VIDC Enhancer	£25

Aries AlphaScan Monitor

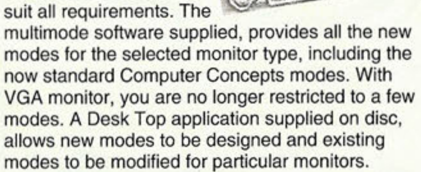
Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The VIDC Adaptor supplied with the monitor allows high resolution operation in all screen modes. **£325**

• Aries Alphascan 17" Plus **£545**

Philips Monitors

• **BM7502** 12" Hi-res Green Monitor	£82
• **CM8833** 14" Med. Res Colour Monitor	£185
• Dust Cover for Philips Monitors	£6
• Spare Monitor Leads (various)	£7

VIDC Enhancer



This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A Desk Top application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: Its unique design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control **£45**

MultiVideo VIDC Card: As above but for MultiScan monitors only. **£25**

Integrex Ink Jet Printers

• Colour Jet 132 Printer	£425
• Paper Roll	£6.50
• BBC Screen Dump Software	£10
• Colour Cartridge £21 • Black Cartridge	£12.40
• 100 A4 OHP transparencies	£55
• 8K Serial Interface Optional	£123
• Colour Jet 2000	£529
• Betajet Ink Jet Printer	£185
• Betajet Cut Sheet Feeder	£43
• Integrex Colourjet Series 2	£335

Printer Leads

• BBC Centronics 4'	£5;		6' £6
• Archi Parallel 2m	£5;	5m £9	10m £13
• PC Parallel 2m	£5;	5m £9;	10m £13
• 25 pin D Male/Male		2m £5;	5m £10
• Centronics Double Ended 4'			£5
• Centronics Double Ended 6'			£6
• RS232 Leads Various			£POA

Star Printers

LC15	£190	LC200 Colour	£151
LC20	£104	SJ48 Inkjet	£169
LC100	£126	XB24-200 Colour	*£324
LC24-15	£245	XB24-250 Colour	*£389
LC24-20	£148	XB24 Colour kit	£29
LC24-100	£143	ZA200 Colour	*£260
LC24-200	£165	ZA250	*£295
LC24-200 Colour	£214	ZA250 Colour	£324

• Star/Archimedes Colour Printer Driver £15

* Includes 12 months On-site warranty

Cut Sheet Feeder

LC10/200/24-10	£49	LC15/LC24-15	£119
XB24-10	£80	XB24-15	£139
XB24-200	£99	XB24-250	£149

Serial Interfaces

8K Ser LC-200; LC24-200; FR10; FR15; XB24-10; XB24-15 £52

Buffers

32K Ram Card for LC/XB24-10; 15; LC200	£55
32K Ram Cartridge for LC24	£54

Star Printer Ribbons

LC10; LC10-II; LC15	Black £4;	Colour £6
LC-200; LC24-200	Black £5;	Colour £12
XB24-10; XB24-15	Black £5;	Colour £12

• Dust Covers for Star Printers £6

NEC Pinwriter Printers

• P20#	£165	• P72	£406
• P30	£235	• P90	£579
• P62	£342		

• P60/70 Colour Option Kit	£59
• Ribbons Black for P20; P30	£6
• Ribbons for P60/70/90 Black £8 Colour	£13.50

Includes 12 months on-site warranty

Cut Sheet Feeders

P20 **£59;** P30 **£85;** P60/62 **£89;** P70/90 **£80**

Panasonic Printers

KX-P1123	£126	KX-P2624	*£269
KX-P1170	£98	KX-P2123M	£144
KX-P1624	£264	KX-P2123C	£194
KX-P1654	*£330	KX-P2180M	£126
KX-P1695	£267	KX-P2180C	£143
KX-P2124	£215		

*** Price includes 12 months On-site warranty**

Cut Sheet Feeders

P36 – 1124/24i **£69** **P37** – 1123/70/80 **£59**

P38 – P1624/95; P2624 **£126**

Buffers

P12 4K Buffer Board for KX-P1081	£55
P14 32K Buffer P1123/24/70/80 P1540/92/95; P1624/54/95	£16

Serial Interfaces

P13 for all above printers **£46**

Original Panasonic Ribbons

Guaranteed to last 3 million characters

• for P1081, 1180, 1123, 1124, 1170	£6
• for P1624, 1695, 2123/24, 2180, 2624	£8
• Colour Ribbons for KX-P1081, 1592 & 1595 Brown, Blue or Red	£9 each
• **P150C** Colour for P2123/2180	£15
• Dust Covers for all 80 column Panasonic Printers	£5

Citizen Printers

• 120D+	£98	• Swift 200	£178
• Swift 9	£145	• Swift 240	£200
• Swift 9X	£185	• Swift 240C	£212
• PN-48	£189	• Swift 24X	£299

• AH29804 Manual Cut Sheet Feeder for Swift 9/24/124. Holds 50 Sheets	£29
• Cut Sheet Feeder for 80 col. printers	£75

+ FREE 2 years Parts and Labour warranty on all Citizen Printers

• Swift 9 Colour Option		£19
• Swift 24 Colour Option		£29
• Swift 24 Ribbons	Black £4	Colour £13
• Swift 24X Ribbons	Black £8	Colour £16
• Citizen/Archimedes Colour Printer Driver		£15

Laser Printers

All Laser Printers include 12 months On-site maintenance

Brother HL4-VE	4ppm	£589
Brother HL4-PS Postscript	4ppm	£970
Brother HL8-V	8ppm	£848
Brother HL-10V	10ppm	£1045
Brother HL10PS	10ppm	£1329
Brother HL10DV	10ppm	£1149
Brother HL10DPS	10ppm	£1445
Canon LBP4 LITE	4ppm	£479
Canon LBP4+ 1.5M RAM	4ppm	£639
Canon LBP-8III Plus	8ppm	£945
Canon LBP-8 plus IIIR	8ppm	£1435
Canon LBP-8 4	8ppm	£989
Epson EPL4300	6ppm	£589
Epson EPL4000	6ppm	£478
Epson EPL5200	6ppm	£575
Epson EPL7500	6ppm	£1139
Epson EPL8100	10ppm	£920
Fujitsu VM800 (Best Buy)	8ppm	£549
HP Laserjet IIP+	4ppm	£530
HP Laserjet IIID	8ppm	£1482
HP Laserjet IIIP	4ppm	£595
HP Laserjet IIISi PS	16ppm	£1993
HP Laserjet IV (600 dpi)	8ppm	£1035
HP Laserjet 4M PS	8ppm	£1425
NEC Silentwriter S62P P/script	6ppm	£994
NEC Silentwriter 266	8ppm	£669
NEC Silentwriter 290P P/script	8ppm	£1459
NEC Silentwriter S102	8ppm	£992
OKI OL400	4ppm	£440
Panasonic KX-P4410	5ppm*	£459
Panasonic KX-P4420	8ppm*	£615
Panasonic KX-P4430 Satin Print*	5ppm*	£589
Panasonic KX-P4451	11ppm*	£899
Panasonic KX-P4455 Postscript	11ppm*	£1249
Star LP-4 Postscript	–	£774
Star LP-8 III 2	8ppm	£1249
Star LP-8 III	8ppm	£899
Star LP-8 Star(post)script	8ppm	£1130
Star LS-5	5ppm	£489
Star LS-5 EX (RISC Based)	5ppm	£599
Star LS-5 TT True Type + Mac	5ppm	£799

* Now with 2 years On-site warranty

Laser Toners

Canon 2, 3 & 4	£46	Laserjet HP IIP & IIIP	£42
Epson GQ	£13	Laserjet II/D, III/D	£48
EPL4/41/4300	£55	Laserjet 4 & 4M	£75
EPL7100/7500/ 8100	£117	NEC SWriter	£78
		Star LP4/LP8	£42
KX-P4420/50/55	£20	Qume Crystal (3)	£85

Laser RAM Upgrades

IIP; III/P 1Mb	£49	Canon LBP4 1M	£105
IIP; III/P 2Mb	£80	Canon LBP8 2M	£125
IIP; III/P 4Mb	£132	EPL7100 256K	£39
II & IID 1Mb	£60	GQ5000 512K	£42
II & IID 2Mb	£96	KX4420/50i 1M	£75
II & IID 4Mb	£142	KX4420/50i 2M	£115
HP4 2Mb £73; 4M	£115	KX4420/50i 4M	£195
NEC S62P/S102		Star LP8 1M	£139
1Mb £99; 2Mb	£180	Star LP8 2M	£275

Laser Drum & Developer

• Epson Drum GQ5000	£93	EPL7100	£129
• Panasonic 4420 Drum	£60	Developer	£80
• Panasonic 4450 Drum	£93		

Jetpage Postscript Cartridge

• HP IIP/III **£225** IID & IIID **£227**

Various Add-Ons

• HP Adobe costscript + Cartridge	£359
• HP Premier Font Collection	£28
• Laserjet various Font cartridges	from £45
• Canon LBP-4 Lower Cassette Tray	£75
• HPIIP/IIIP Lower Cassette Tray	£96
• Laserjet 4 Powered envelope feeder	£199
• LP4 500 Sheet paper cassette 3rd Bin	£205

Laser Direct

P.S. We have now discontinued Laser Direct as the Hewlett Packard Laserjet 4 printer offers better facilities at a lower price. See above.

Hewlett-Packard Printers

DeskJet 500	#£265	DJ Portable	£283
DJ550 colour	#£429	DJ500 colour	#£329
Paint Jet XL	+£1185	Paint Jet	+£495
QuietJet	+£312	PaintJet XL300	+£1775

+ Includes 12 months on-site warranty
Includes 3 years extended parts & labour warranty
- For additional £49, we will convert above 3 years warranty, to 3 years on-site maintenance warranty
- Paintjet Cartridges Black **£14;** Colour **£23**

Desk Jet 500 Accessories

- 256K RAM Cartridge **£69**
- HP Epson FX Emulation Cartridge **£45**
- DeskJet 500 Cart. Black **£14;** Colour **£23**
- High Capacity Black Ink Cartridge **£21**
- DJ500 Colour Archimedes Printer Driver **£15**
- Dust Cover **£6**
- DJ500C Printer Driver for RISC OS 2/3 **£15**
- DJ550C Printer Driver for RISC OS 2/3 **£15**
- 636G 50 x Transparencies A4 **£32**
- 636J 50 x Glossy Paper A4 (also XL) **£25**
- 630Z 50 x Cut Sheet Paper A4 **£12**

HP Paintjet/XL Accessories

- 630P 200 Z-Fold paper 8.5 x 11 **£15**
- 630Q 50 Transparencies 8.5 x 11 **£32**
- 630S 50 Transparencies A4 **£32**
- 630Y 200 Cut Sheets 8.5 x 11 **£14**
- 631Y 200 Cut Sheets A4 **£18**

Plug In Font Cartridges for DJ 500

- 22706B – Prestige, Elite, Line Draw fonts **£55**
- 22706C Letter Gothic & HP Line Draw fonts **£56**
- 22707P – Proprint Emulation Cartridge **£57**
- Desk Jet Unlimited (Book No VAT) **£19.75**

Canon Bubblejet Printers

	Printer	CSF	2nd Bin	Ink Cart
BJ10EX	£160	£43	–	£16
BJ10SX	£105	£43	–	£16
BJ200	£282	–	–	£16
BJ300*	£292	£88	£65	£12
BJ330*	£369	£110	£79	£12
BJC800C	£1329	–	–	£16

* Includes 12 months On-site warranty
- Spare Battery pack for BJ10E **£33**
- BJ10EX – Archi Turbo Driver **£42**

Special Offer:
Canon BJ10EX Printer + CC's Turbo Driver **£199**

Epson Printers

FX870	£273	LQ2550+	£673
FX1050	£343	LX100	£116
FX1170	£339	LX400	£94
LQ100	£147	LX850+	£135
LQ570	£199	LX1050	£203
LQ870	£359	Stylus 800	£244
LQ1060 Colour	£585	SQ870	£409
LQ1070	£310	SQ1170	£560
LQ1170	£434		

- Original Ribbon for LQ100 **£6**

Cut Sheet Feeders for

LQ570, LQ870 **£47**
LX400/850/LQ200/400/450/500/550 LQ1010/1070/1170 **£72**
LX1050 **£115** FX850/LQ860 **£128**
FX1050/LQ1060/SQ850 **£155**
LQ2550 **£299** SQ2550 **£210**

Tractor Feed for

LQ100 **£29;** LQ800 **£44;** LQ850/FX850 **£69;** LQ1050/FX1050 **£85;** LQ2500 **£90;** LQ2550 **£90.**

Accessories

- EX800/1000 Colour Option **£45**
- EX800/1000 Colour Ribbon **£14**
- LQ2500 Colour Option **£65**
- Multifont Card for LQ550/850/1050 **£95**

Epson Printer Interfaces

RS232 **£28** RS232 + 2K Buffer **£52**

Roland Plotters

- DXY1100 **£469**
- DXY1200 **£607**
- DXY1300 **£823**
- DXY2500 **£2345**
- Sketchmate A3 **£499**
- Sketchmate A4 **£308**
- Roland plotter Pens, Fibre tip **£7.50**

Fujitsu Printers

Special Introductory Offer

- B-100 InkJet – HP Deskjet compatible 300dpi, whisper-quiet & 6 resident fonts **#£159**
- B-200 InkJet – HP Desk Jet compatible 300dpi. Built in Cut Sheet Feeder. Optional 2nd Bin/Tractor available **#£249**
- DL-1150 Dot Matrix – 24 pin, 110 column Colour optional **£199**
- DL-1150C Dot Matrix – 24 pin, 110 column With colour option **£244**

DL1250	£309	DL3600	£439
DL4600C	£799	DL5600C	£1049
DL5800	£999	DL1250C	£344

FREE 1 Year On-site maintenance.

- B-100 Cut Sheet Feeder **£59**
- B-200 2nd Bin Sheet Feeder **£89**
- B-200 Tractor Unit **£59**
- B-100/200 Ink Cartridges **£14**
- DL-1100 Colour Upgrade **£39**
- DL-1100 Black Ribbon **£5**
- DL-1100 Colour Ribbon **£11**
- VM 800 Toner Cartridge (8000 pgs) **£99**

Full range of Fujitsu Printers available at very competitive prices. Please telephone for details

Listing Paper (Perforated)

- 1,000 Sheets 9.5" x 11" Fanfold Paper **£7**
- 2,000 Sheets 9.5" x 11" Fanfold Paper **£11**
- 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold **£21**
- 1,000 Sheets 15" x 11" Fanfold Paper **£9**
- 2,000 Sheets 15" x 11" Fanfold Paper **£16**
- 1,000 Sheets true A4 Fanfold Paper 70gms **£11**
- 2,000 Sheets true A4 Fanfold Paper 70gms **£21**

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

Printer Labels

(On continuous fanfold backing sheet)

1,000 off, 90 x 36mm (Single Row)	£6.00
1,000 off, 90 x 36mm (Twin Row)	£6.25
1,000 off, 90 x 49mm (Twin Row)	£7.50
1,000 off, 102 x 36mm (Twin Row)	£6.75

Laser Printer Labels on A4 Sheets

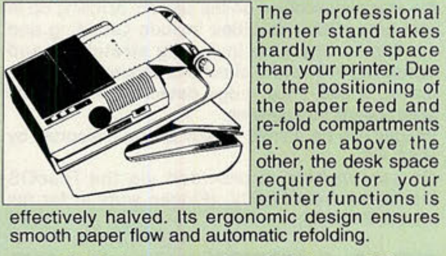
3750 off, 70 x 29mm (3 Rows x 10)	£15.50
2400 off, 70 x 37mm (3 Rows x 8)	£15.25

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
BBC B/BBC Master	–	£4.00
Archimedes Micro pair	–	£9.00
Citizen 120D	£3.25	£5.00
EX800/1000	£3.50	£5.00
RX/FX80/85/800/MX80	£2.95	–
FX/MX/RX100/1000	£3.95	–
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£3.25	£6.00
LQ1050/LQ2500	£12.00	–
LX400/800/850	£3.50	£5.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	£5.00
Panasonic 80 Col. Printers	–	£6.00

Dust covers for most 80 column printers available at £5 each

Professional Printer Stand



The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £24 (carr. £3)
132 Column version £29(carr. £4)

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Type

Connects	Serial	Parallel
2 to 1	£10	£10
3 to 1	£14	£15
4 to 1	£19	£20

Professional Type

Connects	Serial	Parallel
2 to 1	£15	£16
3 to 1	£20	£23
4 to 1	£30	£34

Cables extra at £5 each

Cross Over Manual Switch

2 In/2 Out Parallel	£29
2 In/2 Out Serial	£28
3 In/2 Out Serial	£36

Auto Printer Sharer

Connects	Serial	Parallel
2 to 1	£34	£36
4 to 1	£52	£53
8 to 1	–	£85

256k Multi Spooler

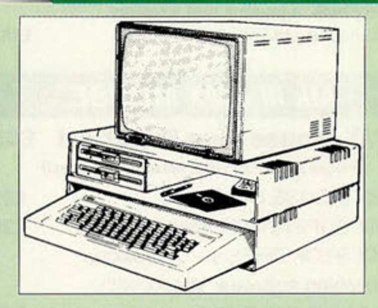
These Auto Parallel Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

- 2 In/2 out **£125**
- 4 In/2 out **£139**
- 8 In/1 out **£185**

Compact Converter Units

Serial to Parallel **£32** Parallel to Serial **£32**

Plinths for the BBC Master and A3000

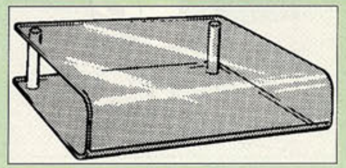


- Single Master Plinth 490 x 310 x 105mm **£14**
- Double Master Plinth 490 x 310 x 210mm **£26**
- A3000 Single Plinth (very sturdy & precision made), has a slot on the left for the switch & cut out on the right for 3.5" Disc Drive **£15**



CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version £16 (carr £3)
136 Column version £20 (carr £4)

Continued→ → → → → → → → →



- Quest Mouse III & Quest Paint £49
- Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont £69
- Quest Mouse III only £25
- Quest Paint Software only £28
- Quest Font Disc (22 Text Fonts) £15
- Quest Mouse Mat (Red or Blue or Green please specify) £3
- Conquest (Quest Paint Extension) ROM £24
- Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer £18
  (P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

Mouse Cleaning Kit

To obtain trouble free operation and prolong the life of your mouse, the high tech rodent requires regular cleaning. Our deluxe mouse cleaning kit is ideal for the purpose £3

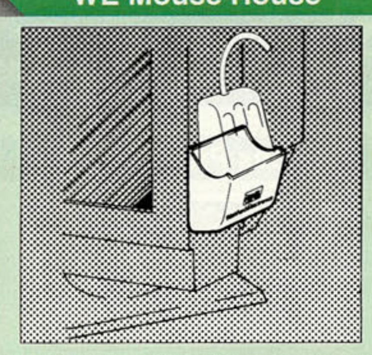
Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes. £15

Mk III AMX MOUSE

- **AMX Mouse plus Super Art £49**
  (Please specify for BBC, Master or Compact)
- AMX MOUSE ONLY £25
- AMX SUPERART Package £26
- AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse £25
- PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker £13
- AMX DESIGN (ROM) £29
- AMX EXTRA EXTRA £16
- MOUSE MAT £3

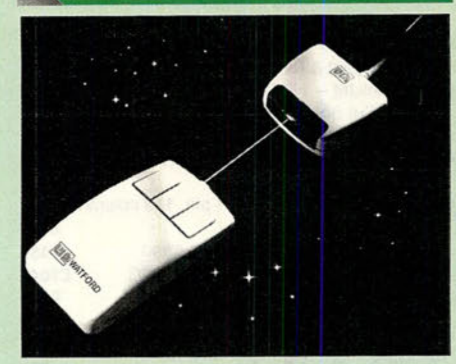
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive etc.

Only £3

Archi Cordless Mouse



Features
- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

Price £32

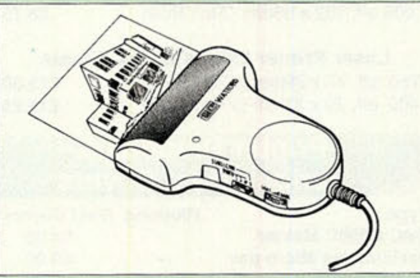
Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version £25
QT-20 Archimedes Version £26

Beeb Hand Scanner



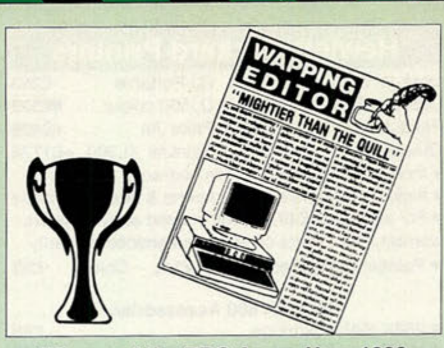
Watford Beeb HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs!

Beeb HandScan & Firmware £99

Archi Mk II Hand Scanner

Watford's Mk II hand scanner has a maximum resolution of 400 dpi. The scanning width is 4". The sophisticated software is supplied in a 64K ROM, located on a standard single width expansion podule. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. Other facilities include Cropping and scaling to any size including stretching and squashing in X and Y directions separately. Colour tinting. X and Y flip. Edge detection which turns solid objects into outlines.
Images can be printed on any printer supported by RISC OS.
On-screen help is provided via the RiscOS interactive help facility. (Please write in for full technical details).

AHS-4 Archi 300/400 Version £109
AHS-3 Archi A3000 Version £119



Winner of the BBC Acorn User 1990 Award for the Best DTP/Word Processor

The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Wapping Editor Software Pack £49
Wapping Editor plus Mouse £69
(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc.
Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out. **£15**

Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.
Also included are two Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions. **£12**

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only). **£13**

Archi A4 Scanner



The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.
Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.
Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.

Archi A4 Scanner £269
Sheet Feeder for above £75
Scanner + Sheet Feeder £359

Z88 Portable Micro



• Z88 Portable Micro	£169
• 32K RAM Pack or 32K EPROM Pack	£16
• 128K RAM Pack or 128K EPROM Pack	£32
• 512K RAM Pack	£86
• 256K Eprom Pack	£55
• Z88 Eprom Eraser Unit	£38
• Z88 Carrying Case	£8
• AA Nicad Rechargeable Battery	£1.50
• Battery Charger Compact & Fast	£6
• Z88 Serial Printer Cable	£8
• Z88 Parallel Printer Cable	£18
• Z88 to Archi Link	£15
• Z88 to BBC Link £8 • Z BASE	£56
• Z88 to PC Link II £27 • Z88 to Macintosh	£32
• Z88 Mains Adaptor £9 • Z88 Modem	£114

Psion Series III



Psion, pioneer of the handheld computer, have once again redefined the state-of-the-art with the Series III. Although only pocket sized, this powerful programmable computer has many features found in desk top machines, plus powerful built-in software. They include a full specification wordprocessor and an outliner that is compatible with Microsoft Word, an extensive database, intelligent time and personal management and a powerful multifunction calculator. And with an interchangeable memory of up to 4Mb, you'll never be short of data storage space.

Psion Series III Computer
- Series 3 128K £139 • Series 3 256K £179

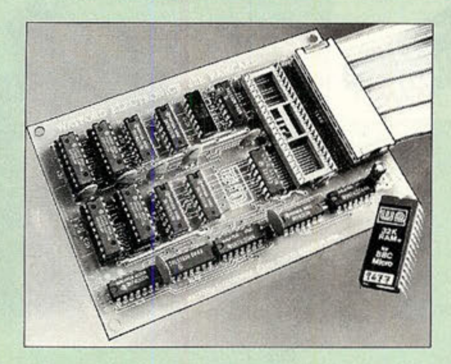
RAM Solid State Discs (SSD)
- 128K £68 • 512K £170 • 1Mb £255

Flash Solid State Disc (SSD)
- 128K £34 • 256K £59 • 512K £102
- 1Mb £170 • 2Mb £255

Communications
- Parallel Interface Link £25
- RS 232 Serial Link for PC £58; Mac £59

Various
- Mains Adaptor 9V AC £12
- Spreadsheet £59
- Professional Finance £42
- Spelling Checker/Thesaurus £42

32K Shadow RAM/Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

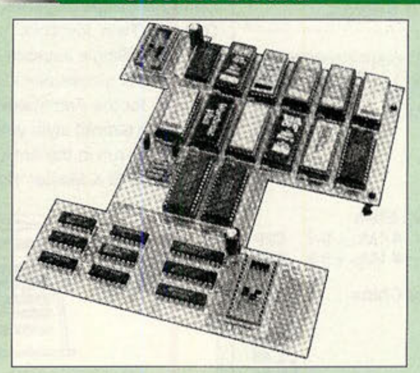
Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K bytes free – 5 times as much as normal.

- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.

Only £49

Solderless Sideways ROM Socket Board



- Increases your BBC Micro's ROM capacity from 4 to 16.
- **No soldering required.**
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish" allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £32

Battery Backup fitted **£35**

Battery Backup only **£3**

16K Sideways RAM **£8**

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

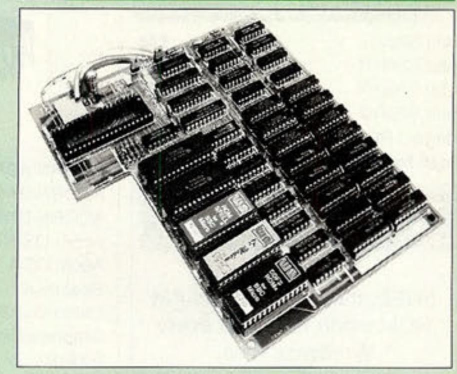
Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

Watford POWER DUCK £8

ROM/RAM Card



- No Soldering required to fit the board.
- Compatible with BBC B
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).

PRICES:

• ROM/RAM card with 32k DRAM	£39
• ROM/RAM card with 64k DRAM	£52
• ROM/RAM card with 128k DRAM	£83

OPTIONAL EXTRAS:

• 16k plug-in Static RAM kit	£8
• 16k DRAM for Upgrade	£13
• Battery backup	£3
• Read and Write protect switches	£2 each
Complete ROM-RAM card with all options fitted	£99

ROM Cartridges for the BBC Master

Will accept the larger Piggy Back ROMs like Interword, Quest, etc.

• Twin **£9;** • Quad **£14**

Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00;** Dual **£3.75**

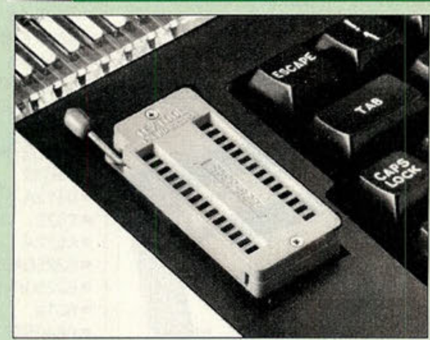
Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable
Single **£4** Twin **£6**

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	–
6 way Power Connector	120p	150p

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without having to open the lid. The ZIF socket is located into the ROM Cartridge's position. It is very simple to install. No soldering required. Also included in the price is a plastic see through storage case with antistatic lining, which allows you to store 12 ROMs.

£18

Computer Concept's ROMS

Inter BASE	£49
Inter CHART	£25
Inter SHEET	£37
Inter WORD	£36
Mega-3 ROM	£76
Spell Master	£42

Wordwise plus

£38

FREE, the superb Word-Aid ROM worth £24, with every Wordwise Plus.

Word-Aid

This advance utilities ROM extends the power of your Wordwise plus ROM.

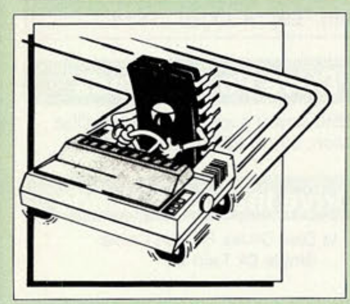
Only **£24**

(N.B. Word Aid requires a Disc interface in your Micro)

Acorn ROMS

View 3.0 ROM	£45
Viewsheet (Acornsoft)	£36
Viewstore	£36
Viewspell – 80T disc	£25
View-Index	£12

View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

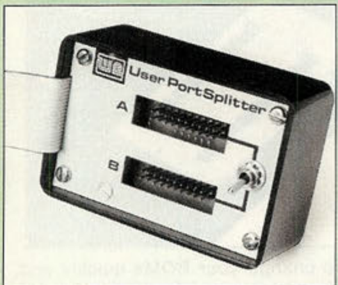
Price: Only £29

Mini Office 2 – Disc

for BBC B & B+ **£12**

(When ordering please specify for which Micro & 40 or 80T Disc)

User Port Splitter Unit



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows you to connect two devices simultaneously to the BBC's user port.

Excellent Value at **£22**

Assorted ROMS



ACORN ADFS	£25
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Acorn OS 1.2	£14
Beebmon	£22
Dump Out 3	£25
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GXR-B	£21
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Master ULA (47)	£15
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Numerator – BBC	£39
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1Mb OS ROM	£39

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1 MB ZIF D-RAM	£4.00
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256K x 4-8 ZIF	£4.00

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• 256K x 9-8	£9	• 1Mb x 9-8	£33

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• 6264LP-8K	£4.00	• 74LS244	£1.00
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Acorn Speech Synthesizer package complete, for the BBC B Microcomputer
Special Offer £14

Commander Joystick



Features:

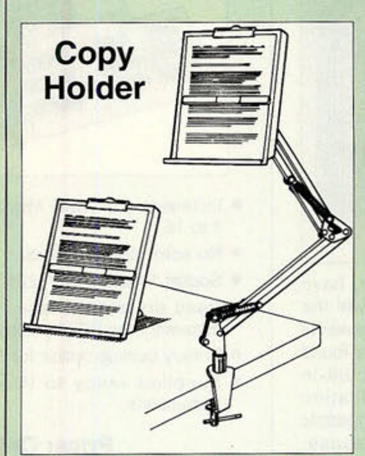
- Direct connection to BBC Analogue input port – interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

Price: £15

Voltmace Joysticks

Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
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Analogue aircraft style yoke	
Joystick to run in the analogue port of the BBC B & Master 128	£25

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Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly be means of a plastic retaining ruler and a clip grip.

Desk Top **£8**
Angle poise **£12**



Copy holders as above but with a battery operated, remote controlled cursor/ruler. (By hand or foot pedal.) (Batteries 2 x AA not included.)

Desk Top **£15**
Angle poise **£20**

Adder EPROM Programmer

Adder EPROM Programs 2764 and 27128 EPROMs for the BBC and BBC Master. Connects to the User port.

Offer Price: **£39**

TEX EPROM ERASERS

Over erasure of EPROMs very rapidly turns them into ROMs!
The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast.

- **ERASER GT** – Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£36**
- Spare UV tubes. **£12**

ROM Extraction Tool

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip.

- Plastic Chip Extractor **£2**
- Metal Chip Extractor **£3**

Servisol Foam Cleaner

This king size multipurpose foam cleaner spray is ideal for cleaning Keyboard, Monitor, Disc Drive & Computer furniture surfaces.

£2.50

Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/Monitor Screens.

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Ideal for removing dust & dirt from Keyboard & similar inaccessible spaces. **£3**

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• MAILIST • EASILEDGER –
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• BEEBPLOT

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Do you have to use both Acorn computers and PC's? Would you like to use your Archimedes or A3000 in PC-emulation mode but are unsure of the new commands?

Although Acorn machines (such as the BBC B, the Master, the Archimedes) are mainly used in education, most commercial computers use other operating systems, particularly MS-DOS. As a result school computer users are at a disadvantage when moving into 'business' computing. PCs and other commercial computers use MS-DOS as the operating system, so commands for formatting, copying, backing up, printing and the modem are not the same. Even file names are written differently! And did you know that there is one Acorn command which, if used in MS-DOS, wipes everything in the current directory?

'ACORN TO PC' enables you to change over painlessly. It shows clearly and quickly how, why and where the two systems (Acorn and MS-DOS) differ. As with a foreign language dictionary, you can use the book to transfer either way – from Acorn to MS-DOS, or from MS-DOS to Acorn.

Price: £8.95 (No VAT)

The Complete BBC Computer User Handbook

If you own a BBC B, B+, Electron, Master 128 or Master Compact, or Archimedes, then this is the book for you. It shows how to get the best from your machine, and how to make it work for you.

Only: **£9.95** (No VAT)

Beeb PC (BASIC)

Designed for program authors to convert BBC programs to run on IBM PCs.

Price: £38

Beeb DOS 3.0

(Now reads Archimedes Discs)

Beeb DOS is a collection of utilities which run on the PCs and enable it to read and write information on BBC Discs.

Price: £39

The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included.

Price £5.95 (No VAT)

Example programs on Disc £4.95

The Epson RX/FX Printer Commands Revealed Handbook

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you with all sorts of printouts to show its capabilities – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

£4.95 (No VAT)

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For the BBC A3000 / Acorn Archimedes

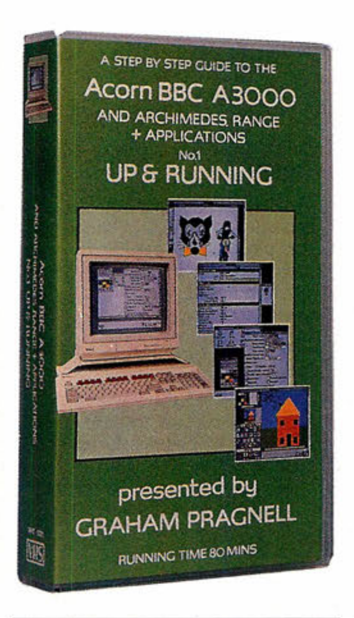
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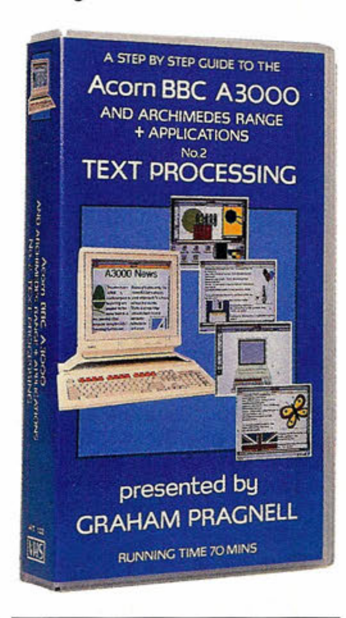
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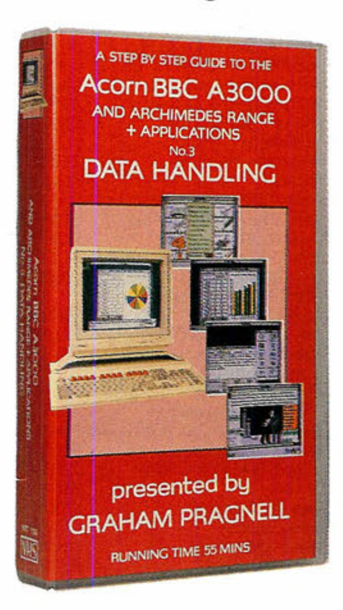
BBC ACORN USER

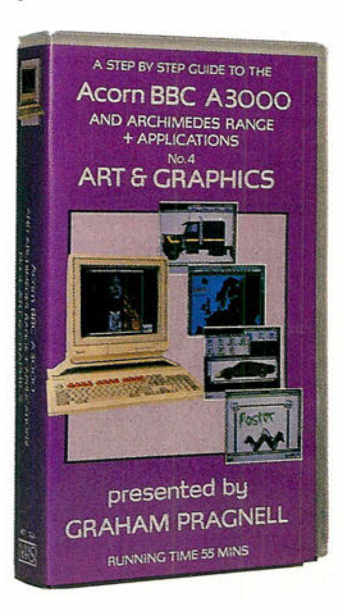
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1. Up & Running

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This video features:

- How to load and run software
- How to save to disc
- How to print
- How to edit text through *Edit*
- How to handle graphics through *Paint* and *Draw*

2. Text Processing

Word processing offers easy text manipulation for highly polished results, while Desktop Publishing offers a variety of page formats and the use of diagrams and pictures

This video features:

- *First Word Plus*
- *Phase#2*
- *Ovation Professional DTP*
- *Technoscan II*

3. Data Handling

Your BBC A3000 / Acorn Archimedes offers powerful data processing coupled with professional graphic display

This video features:

- *Data Sweet*
- *Squirrel*
- *Schema*
- *Genesis*
- *Magpie*

4. Art & Graphics

Speed and ease of use makes the multitasking BBC A3000 / Acorn Archimedes computer superb for art and graphics. Effects can be created and undone at the touch of a button. Make full use of the 256 - colour palette that the machines put at your fingertips.

This video features:

- *Paint*
- *Poster*
- *Revelation*
- *Technoscan II*

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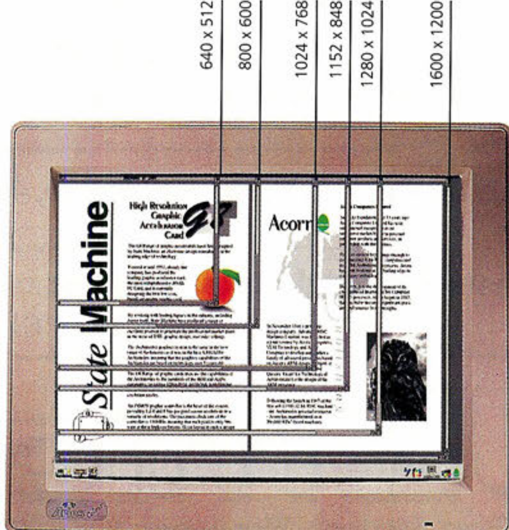
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Performance test on A440/1, ARM2






23 seconds

10.5 seconds



640 x 480 x 256 without G8 card



640 x 480 x 256 with G8 card

Operation time in seconds

Normal / G8 Accelerated — Sheer, Rotate, Anti-aliased Sprite redraw, Flood fills, Complex redraw, Image enhance (scale 0–100)

A comparison of speed performance between a standard A440/1 and one fitted with a G8 Accelerator Card from State machine.

Specification

Maximum Resolution (Square Pixels)	1280 x 1024 @ 4 colours 1152 x 848 @ 16 colours 800 x 600 @ 256 colours
(Rectangular Pixels)	1600 x 1200 @ 16 colours 1152 x 848 @ 256 colours
V. Scan Frequency	*56-110Hz (NI), 87Hz (I)
H. Scan Frequency	*31.5-75KHz
Video Memory	512KB
Output Video Signal	Analogue RGB (RS-343A) Compsite grey level 15 and 9 pin connectors
Sync	H. Sync (TTL Level) V. Sync (TTL Level) Composite (TTL Level) Sync on Green
Palette	24 bit (16.7 million colours)

*Mode dependent, (NI) = Non Interlaced, (I) = Interlaced



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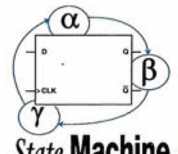
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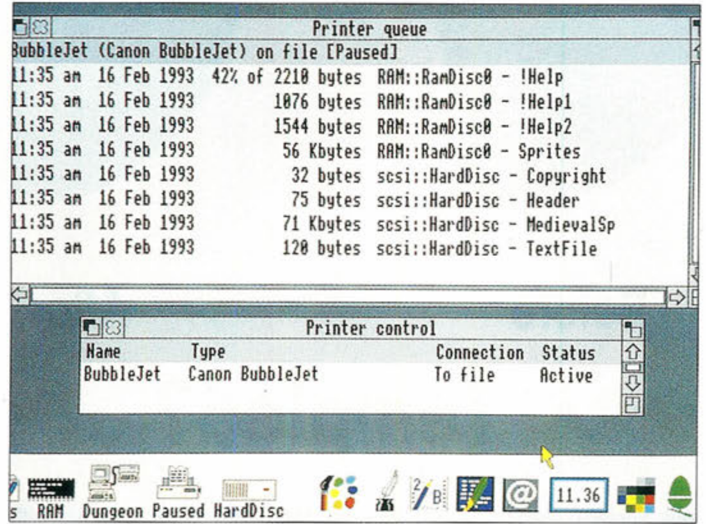
75 Upper Wellington Street, Luton. LU1 5AA. (0582 483377)

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SURVIVING THE RISCS

Mark Moxon offers advice for the perplexed Risc OS 3 user

When we asked you in February to let us know if you had any difficulties with the upgrade to Risc OS 3, we hardly thought the response would be so great. Here are some of the more common problems you've had . . .



Printer queueing is possible with Risc OS; it just doesn't always multitask

● 'I thought that I would be able to drag a number of *Draw* files to the printer queue to achieve background printing, but the hourglass appears when I drag the first one and it remains until the file is printed. It therefore seems to be impossible to achieve a printer queue and background printing.'

Neither Risc OS 2 nor Risc OS 3 support background printing for all files: it depends on the type of file you are trying to print.

For example, when a *Draw* file is printed, either by choosing the print option from *Draw* or by dragging a *Draw* file to the printer manager, *Draw* hogs the machine while it prints.

There is nothing the printer manager can do about this, and indeed most applications print this way (for example: *Impression*, *Ovation* and *Paint*). However, there are two occasions when queueing comes into play . . .

The first is when a selection of files is dragged to the printer manager. These are queued and, although the machine will be taken over while printing takes place, all the files will be printed in turn, which wasn't possible on Risc OS 2.

The second is when the file can be printed in the background. The most common file which can be printed this way is the text file. If you bring up the printer queue window and drop a text file onto the printer manager, you will see the percentage figure change as the file is printed.

While this is happening, you can drag any other file to the manager to join the queue (even *Draw* files). The computer only 'hangs up' when it comes to print a file for an application which does not support multitasking printing.

● 'Help! I have an A5000 hooked up to a Hewlett Packard DeskJet 500C colour printer, and since the upgrade to Risc OS 3.10 I am unable to print anything.

I have contacted Acorn, who told me that the new upgrade does not support the printer driver required for my printer and that my old one – from Risc Developments – was of no use. They told me I should purchase the Ace Computing printer driver, which would make the total cost of my upgrade £60.'

You certainly don't need to shell out any more money for a 3.1 version of the printer driver. If you send your printer driver disc back to Risc Developments, the company will upgrade it for free.

This does illustrate a valid point: Risc OS 3 contains a large number of changes from Risc OS 2, and as a result not all software will work correctly on the new system, especially when it comes to printing. If you have problems with particular software, contact the producer, and the chances are they will be aware of the problem.

● 'Risc OS 3 has the effect of slowing things up. I hadn't realised this would happen. Screen refresh rates are now sluggish and fonts take longer to draw when using *Impression*. I had to spend another £170 or so to upgrade to an Arm3 to make Risc OS 3 usable.'

There is no doubt that Risc OS 3 is a little slower than its predecessor, and to some this can be most frustrating. Although £170 is a lot of money, the Arm3 really does transform the machine, and it's one of those upgrades that you can't live without once you've taken the plunge.

Risc OS 3 on the Arm250 (as in the A3010, A3020 and A4000) is perfectly acceptable, but on the older Arm2 machines with slow memory, the upgrade can be sluggish. You pays your money and you takes your choice.

RISC OS 3.1 BUGS

● The Auto boot option in the desktop boot file save box does not have any effect. To save your boot file so it is automatically run when the machine is turned on, you must do the following. If you have saved the boot file onto an ADFS disc, then press F12 and type:

*Configure FileSystem ADFS
*ADFS
*Mount 4
*Opt 4 2
*Configure Boot

If you have saved the file onto a SCSI disc, then press F12 and type:

*Configure FileSystem SCSI
*SCSI
*Mount 4
*Opt 4 2
*Configure Boot

In each case, press RETURN twice at the end, and then press CTRL-RESET. Each time you turn on the machine, your boot file will be run. Note that in the above, the *Mount 4 command should be changed to refer to the drive containing the boot file, so if you are putting the boot file on a floppy disc, you should type *Mount 0.

● DOS discs must be dismounted after use, otherwise files may be corrupted.

● ADFSBuffers should be set to 0 on the A3010, A3020, A4000, A5000 and A4. If ADFSBuffers is set to a higher value, then there is a small chance of floppy disc corruption. To set this to zero, press F12 and type:

*Configure ADFSBuffers 0

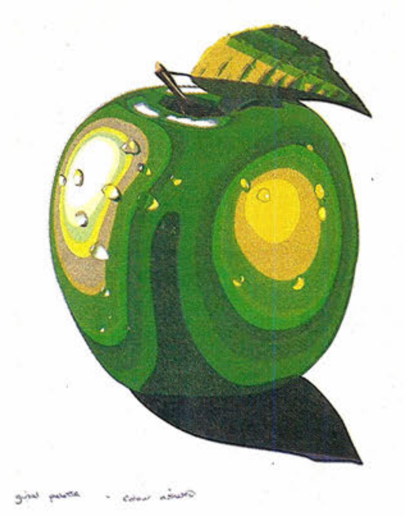
followed by RETURN twice. Then shutdown and switch off the computer, and turn it back on after at least five seconds.

● **Any other problems? Drop us a line . . .**

What can an Ace ProDriver do for me?

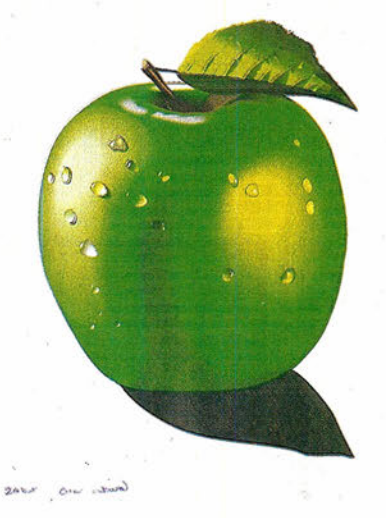


Standard Deskjet 500C Driver



Before

Deskjet 500C ProDriver



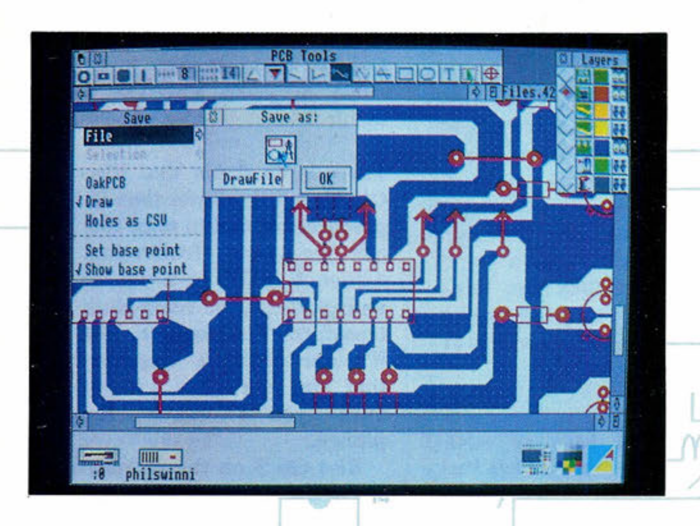
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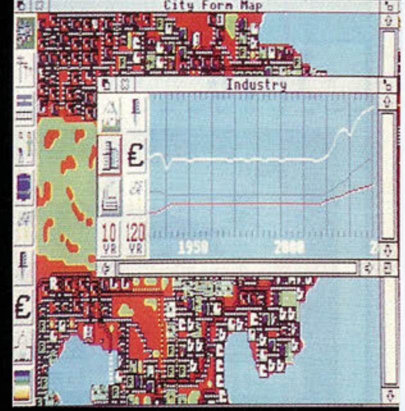
ACORN USER

SPRING SHOW '93

SPECIAL SUPPLEMENT



NEW VENUE



GAMES



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PERSONALITIES



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APRIL 15 – 17 1993

THE BBC ACORN USER SPRING SHOW

Spring is in the air, and it's time for another show; get the details here

The BBC Acorn User show is often cited as the most important date in the Acorn calendar. As a forum for exhibitors and visitors alike, it has established a well-earned reputation as a launch pad for new releases, a venue where visitors can try out existing software and a haven for the bargain hunter. This year promises to be no exception to the rule.

The Spring Show, opening on 15 April, marks the main Acorn event outside London, and should give many readers the chance to attend for the first time. Based in Harrogate, the show is within easy reach of northern towns such as York, Leeds and Manchester, and the town itself is an attractive venue for any weekend visitor. But, of course, what most visitors will want to see are the products themselves . . .



Harrogate: the first northern venue for the Acorn User show

THE EXHIBITORS

With over 50 exhibitors, catering for education, business and home use, there is certainly plenty to see. The Acorn stand will be the first stop for many visitors, and Acorn will be showing off their latest range of hardware and software.

Major attractions will include the new integrated software package, *Advance,* of particular interest to budget-conscious schools. All visitors should check out the Replay DIY kit, which allows the user to transfer moving video footage to their machine. Other points of interest include the multimedia expansion kit and Acorn's new branded PC card. And all this is just on one stand: for a thorough look at what the show has to offer, turn to page 56 for our stand-by-stand guide.

GAME SHOW

The *Acorn User* Spring Show will have plenty to keep game players happy, with new releases from some of the leading companies.

To add to the joyous atmosphere, Acorn will be running a regional competition. Entrants to the contest will be invited to race around a specially-adapted track that is based on



Win a ride in a real Lotus at the Acorn stand

Krisalis' *Lotus Turbo Challenge 2* game. The finalists get a chance to try out the real thing, with a spin around the Lotus racing track and – yes, you've guessed it – the consolation prize is a palm-sized version of the real thing.

Another attraction for games fans is the guest appearance of Dominik Diamond on Friday 16 April. Dominik hosts the popular *Gamesmaster* TV



Dominik the game show host

show, and can also be heard daily on his BBC Radio One games spot.

During his day at the show, Dominik will be talking to Acorn gamesters, presenting prizes and testing his mettle against challengers. You can find Dominik close to the *Acorn User* stand in the centre.

MEET THE TEAM

The *Acorn User* stand is the ideal stopping point for all vistors to the show, since we will be selling the latest issue of *Acorn User* packed with reviews of the new show products. The show issue will also provide the final guide to exhibitors, with all those last-minute entrants.

We can be found in the centre of the exhibition and, as always, we want to hear *your* views. We will also be happy to answer any queries and provide technical advice.

TICKETS

The show runs from 15 to 17 April, and tickets are available on the door. However, to avoid the queues and save money, you can order advance tickets to the show (see the Show Details box above).

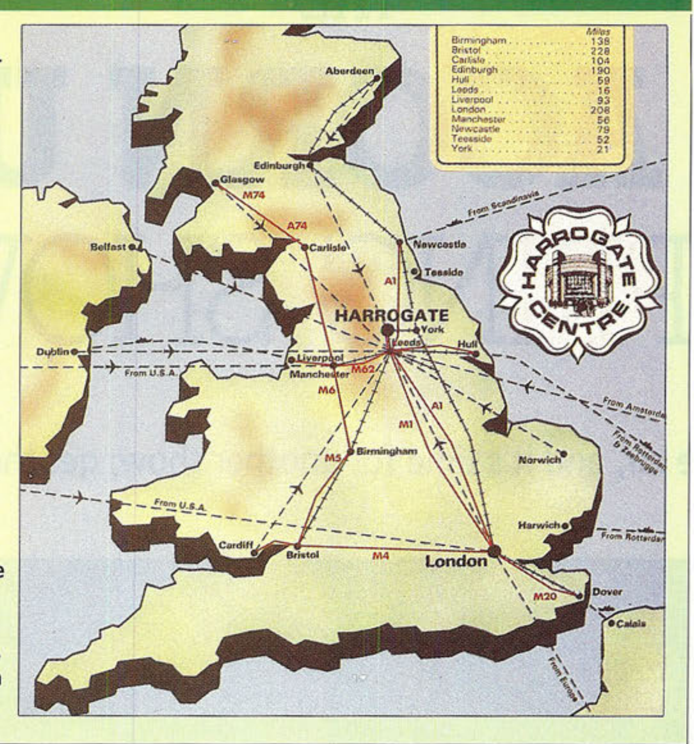
SHOW DETAILS

The show will take place in Hall D of the Harrogate International Centre, Kings Road, Harrogate

OPENING TIMES:
15 – 17 April (Thursday to Saturday): 10am – 6pm daily

PRICES:
Adults: £4 advance (£5 at door)
Children under 16: £2 advance (£2.50 at door)
Family ticket: (2 adults, 2 children): £10 advance (£13 at door)
Under-fives: free
To obtain advance tickets, call Safesell Exhibitions on (0737) 814713

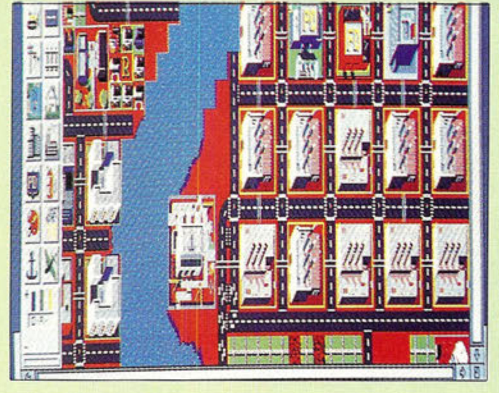
TRAVEL:
Rail – Take the train to Leeds or York and change for Harrogate. The Harrogate International Centre is a few minutes walk from the station.
Road – Harrogate is close to the A1, and roughly a 20-minute drive from Leeds or York.



THE TREASURE TRAIL

For the price of some keen-eyed observation and a few minutes of brain-teasing, you could win a bumper prize in The Treasure Trail, sponsored by *BBC Acorn User* and TDK.

As you wander round the show, keep a look out for all the special letters displayed on many of the exhibition stands. Each stand with a letter on view has made a donation to our Treasure Trail bumper prize. Make a note of all the letters and, at the end of the day, simply combine all the letters to produce an appropriate phrase. Fill in your anwer in the form provided with the free show guide, and hand it in to one of the *Acorn User* team on the stand. It's simple and it's free, open to all the visitors to the show and every entrant receives a free TDK floppy disc, whether the answer is right or wrong.





If you do get the answer right, you could win a huge range of great prizes. There will be more details next month, but just to get your mouth watering, there will be some brand new games from Krisalis, a copy of EMR'S drum sequencer *RhythmBox 2*, *Talking Word* from Wyddfa, an annual subscription to *Acorn User*, a language package from Stallion and 4Mation's brilliant animation program *Noot*. The box of goodies will be on show on the *BBC Acorn User* stand, and we'll be pulling the winning entry from the hat after the show closes on Saturday.

The second show competition is for readers in the Harrogate area. Keep a sharp lookout for adverts in your local newspaper and you could find yourself the proud owner of a brand new Acorn machine.

Finally, some schools in the area have entered a competition to design the show poster. See the results at the show and in a future issue of *Acorn User*.

Claire Foxley



NETGAIN

HIGH SPEED APPLICATION LOADER

Netgain is a real breakthrough in Econet technology which reduces the frustration of slow load times for applications.

The system manager selects his most frequently used applications and installs them on the Netgain server. This server may be any Archimedes with a hard disc on the network, and can of course also be running the Level 4 fileserver software.

From then on these applications are available to any user on the network that is designated to receive the Netgain service. Selecting which computers are Netgain clients is achieved by simply selecting their station number in the management software.

To the user, Netgain appears on the icon bar as a standard Acorn filing system, just like a floppy drive or network. The user simply clicks on the icon to open a directory viewer containing his applications. These may be loaded at hard disc speed simply by clicking.

Netgain is compatible with all types of Acorn fileserver as well as SJ Research MDFS.

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THE SPRING

Your guide to the wealth of new and established products

4th DIMENSION

Stand 49

4th Dimension has been working overtime to get its latest game, *Dungeon*, ready in time for the show. And there could be some special show offers on such popular 4th Dimension games as *Black Angel*, *Chocks Away 2* and *Chopper Force*.

On a more serious note, 4th Dimension will be highlighting its new *10 out of 10* educational software range. So far, this includes *Early Essentials* for under 7s, *Maths* for children aged from 6 to 16 years, and *English* for a similar age group. A selection of foreign language modules and an algebra pack are expected soon and could be demonstrated.

ACORN

Stand 35/37

Acorn's stand is right at the front of the hall and most of the current product range will be on display.

Recently launched products to look out for include *Advance*, Replay DIY and the multimedia workstation. See page 22 in this month's issue for a review of all these new products. The Acorn stand will also be featuring their Lotus competition.

APRICOTE SOFTWARE

Stand 69

If you need an accounting package for your Archimedes, a pause to consider the *Prophet* accounts package on Apricote Software's stand may well be in order. Apparently, Acorn uses *Prophet*, complete with a dummy currency called 'Nuts' to monitor the performance of its dealer network.

BBC ACORN USER

Centre

A stand definitely not to be missed! We will be collecting entries to the bumper Treasure Trail competition, sponsored by TDK and Acorn User. As usual, the *BAU* team will be there to answer your technical queries, and back-issues of the magazine will be on sale.

Plus *GamesMaster* presenter Dominik Diamond will be close at hand on Friday to spur on all budding gamesters.

CIS

Stand 59

Cambridge International Software expects to have no less than nine new products to show. These range from music systems to games and educationals software. *Music Station*, previewed at Bett, is a Midi-based sequencer, synthesizer and notator. From sound to light comes *Photopia*, an entry-level image processing application.

Recently released games *Killer Bugs*, *Serpents*, *Humanoids* and *Robotix* will be keeping the kids happy. More serious applications include *Spellbound*, a spelling tutor, and *E-Numix*, a maths strategy application. A new modular range of applications to help dyslexics will also be debuted at the show.

COLTON SOFTWARE

Stand 57

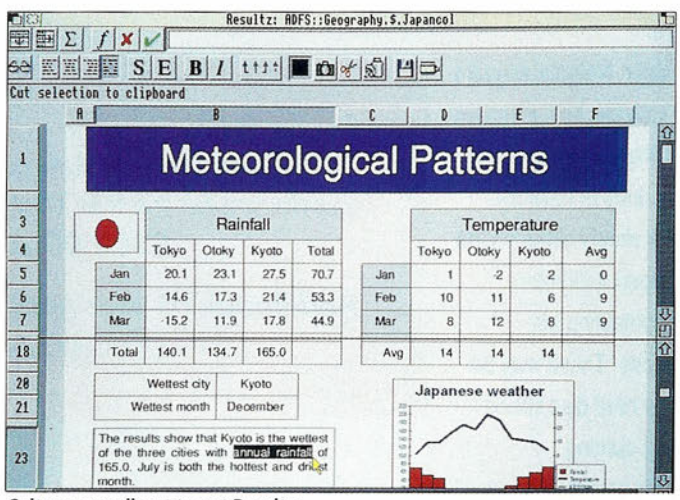
For many show visitors, Colton Software's stand will provide the first opportunity for a look at the release version of the new *Wordz* word processor as well as *Resultz*, Colton's alternative to its long-standing flagship spreadsheet *Pipedream* 4.

Wordz and *Resultz* are Colton's response to feedback from some users who think that, powerful though it may be, with its combined spreadsheet and word processing facilities, *Pipedream* is too complex and distant from Risc OS ideals.



4th Dimension's 3D space game Black Angel

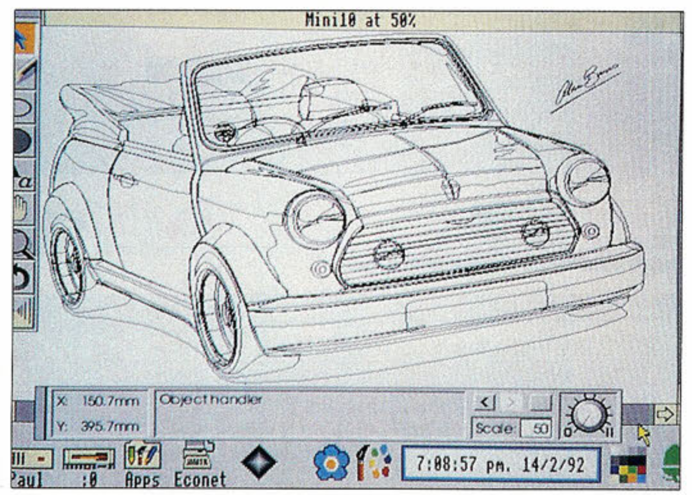
Apricote's Prophet: popular with Acorn



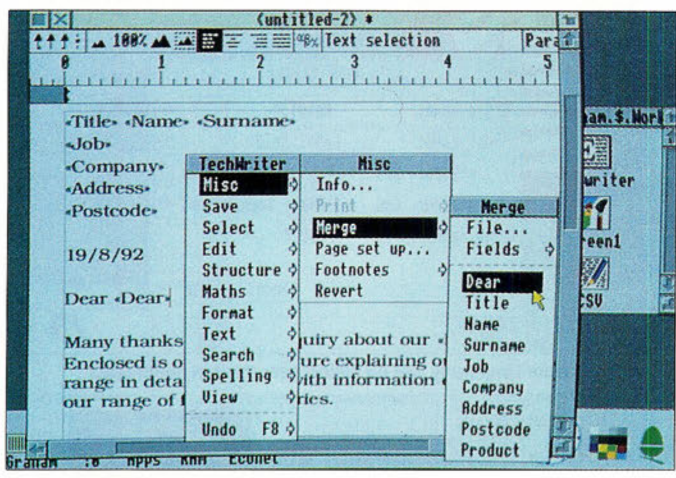
Colton goes all out to get Resultz

COLLECTION

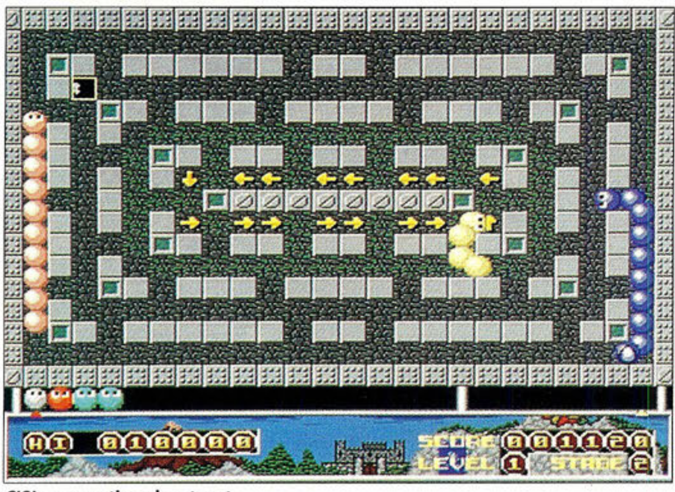
that will be unveiled at the Acorn User Spring show



Computer Concepts will be showing that ArtWorks



Icon's Techwriter makes equations easy



CIS's serpentine shoot-out

COMPUTER CONCEPTS

Stand 33/39

New products from Computer Concepts at the show will include a version of the Colour Card graphics accelerator for the A3000, new versions of *ArtWorks* (1.1) and *Impression* (2.18). CC is also hoping to have its long-awaited thesaurus application on sale, which will definitely be demonstrated at the show.

A new printer is on the way too, though at press time it wasn't certain if that would be ready in time for the show.

As usual, Computer Concepts will have a number of staff on hand to answer technical queries plus the now-familiar Computer Concepts demonstration theatre.

DIGITAL SERVICES

Stand 55

Digital Services will have the latest version of its highly successful *Squirrel* database system on show and purchasers will be given a free copy of *Waiter*, a menu utility.

If you've not come across *Squirrel* before, you will be able to familiarise yourself with the package with a special rolling demo which uses no less than 17 megabytes of digitised speech to take you through an introductory *Squirrel* tutorial session.

Digital Services will also be showing its *Netgain* system for high-speed Econet data transfers.

HCCS

Stand 41

The Ultimate Expansion System will be the star attraction on the HCCS stand. A HCCS micropodule adapter will be shown for machines with full-size podule backplanes. Two micropodules will fit into the space previously taken up by a single full-size Acorn expansion card.

HCCS's SCSI interface, Vision and HiVision digitiser micropodules are already available and, at the show, HCCS expects to add a direct drive laser printer micropodule called Laser Express.

Midi, colour video, serial port and hand scanner micropodules are all in various stages of development and some will be on show. HCCS will also be showing its memory upgrade options.

ICON TECHNOLOGY

Stand 5

Spruced-up icon bars and added features like drag and drop text editing are currently being added to Icon Technology's range of word processors, including *EasiWriter*, *TechWriter* and *StartWrite*.

These improvements should be completed in time for the show, as will a facility to link *StartWrite* to speech synthesizers. This will enable passages of text to be spoken using either PEP Associates' *Speech System* or Superior Software's *SPEECH!* applications.

ICS

Stand 1

ICS says it will have one of the widest selections of software and hardware products at the show. New products will include the ICS *ideA* filing system on Rom for the A5000 and A4 notebook. *ideA* can partition your IDE disc drive with different levels of password protection.

ICS says there have been improvements made to the *ideA* code that mean faster throughput and background operation. The Rom version of *ideA* is expected to sell for £39, but show offers will be available.

Another item to look out for is a 3,500 strong collection of full-colour *Draw* clip-art.

IFEL

Stand 51

Cornwall-based IFEL, best known for Arm3 processor and memory upgrades, is working on a secret project which it hopes to be able to demonstrate at the show. No amount of prodding could persuade IFEL to divulge its secret, so a wander over to its stand on the day will reveal all.

INTEGREX

Stand 79/81

Pride of place on the Integrex stand will be the new Colour-Jet Series 2 compact colour printer. Based on Hewlett Packard DeskJet mechanics, the Colour Jet 2 looks almost identical to the Acorn/Olivetti JP150 and the Fujitsu B100 models; except these are all mono only.

Integrex supplies Risc OS 3.1 printer drivers with the printer as standard, but those who wish to will be able to buy the Risc OS 2 driver from Integrex at the show.

IOTA SOFTWARE

Stand 5

Iota is on the same stand as Icon Technology, and the company's centrepiece is its *DataPower* database package. This is popular with schools, and a special *DataPower* application is provided for teachers to log attainment targets. Iota says it's likely they will be offering discounts too.

IRLAM INSTRUMENTS

Stand 61

Unsurprisingly, sharing the same stand with Uniqueway will be Irlam Instruments who will be demonstrating their new Acorn Replay video capture hardware. The two companies will no doubt have a variety of impressive Replay clips to show on their stand.

KRISALIS

Stand 23/25

After the tremendous success of *Populous*, Krisalis will be launching the popular simulation game, *Sim City*. Long overdue on the Arc, *Sim City* has been a huge success on other computer platforms and there's no reason why things should be any different on the Archimedes. Also to be debuted at the show by Krisalis will be *Battle Chess*.

LINDIS UK/LINGENUITY

Stand 65

Lingenuity will be showing *Reelax*, a new print spooling application for temporarily storing printer data to hard disc. The company's SCSI Share allows several Archimedes to share both hard discs and CD-Rom drives.

New SCSI networking software will also be released at the show, along with a new CD-Rom pack complete with bundled software. A new version of the *CableNews* multimedia authoring package will be shown too.

On the other half of Stand 65 will be Lindis UK, the Acorn dealer sibling to Lingenuity, who will be offering a range of special show offers.

LONGMAN LOGOTRON

Stand 45

First Logo for the Archimedes will be launched at the show by Longman Logotron. Previewed at Bett, *First Logo* will be on sale at the show and the normal price will £24+VAT or £72+VAT with a site licence. *First Logo* and orders for all other Longman products at the show will be discounted by 20 percent. Also featured on Longman's stand will be the much-heralded *Eureka* spreadsheet.

OREGAN SOFTWARE

Stand 71/73

Music promises to attract attention to the Oregan stand, as one of its main products is *Digital Symphony*, an advanced sound track editor compatible with *ProTracker*.

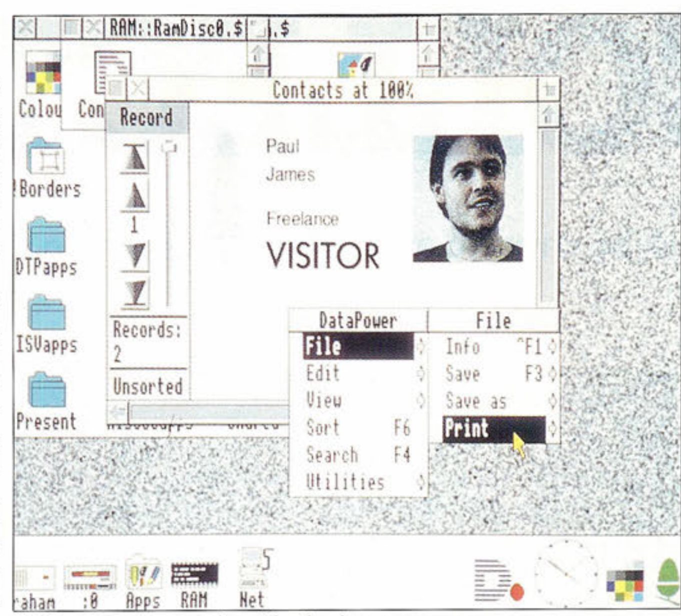
At the other end of the software spectrum comes *Archivist*, Oregan's database package which is music-compatible. Three new games will hopefully be previewed at the show, including *Arcturus*. A 20 percent discount on all Oregan products will be offered to show visitors.

RISC DEVELOPMENTS

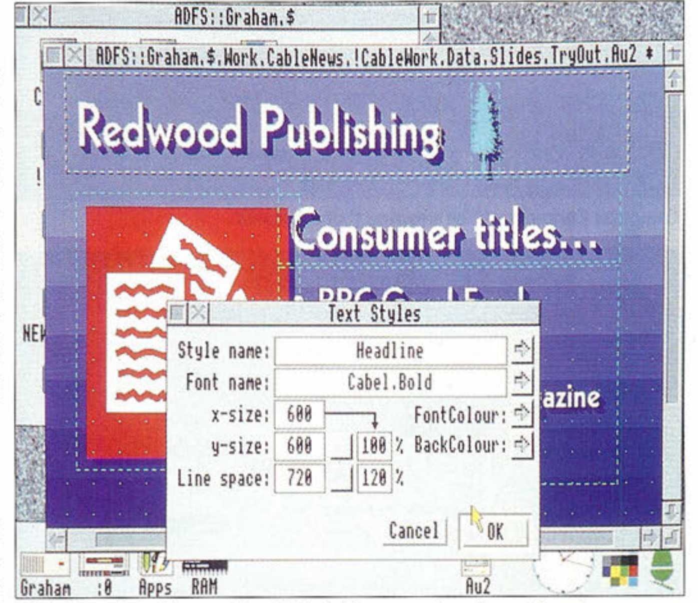
Stand 3

Risc Developments and Beebug will be showing off their usual range of software and hardware products, along with their Arc and Beeb user group magazines.

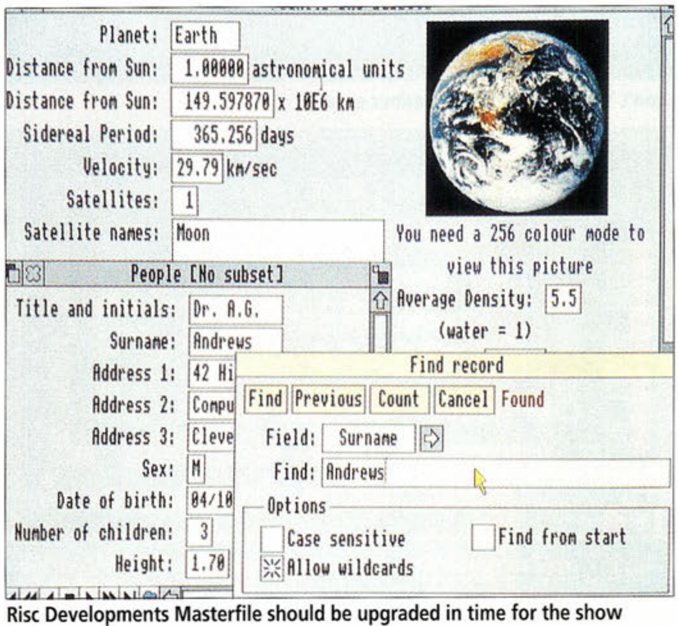
At press time, Risc Developments was hopeful that it would have its new



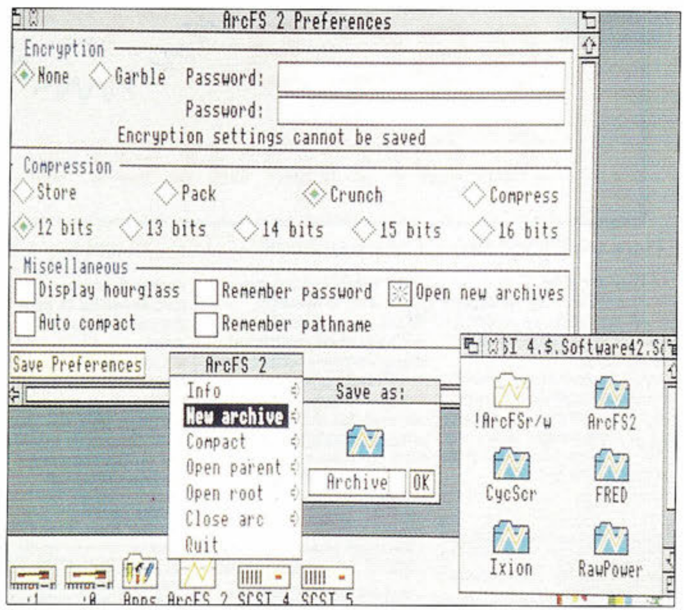
Iota's DataPower: popular with schools



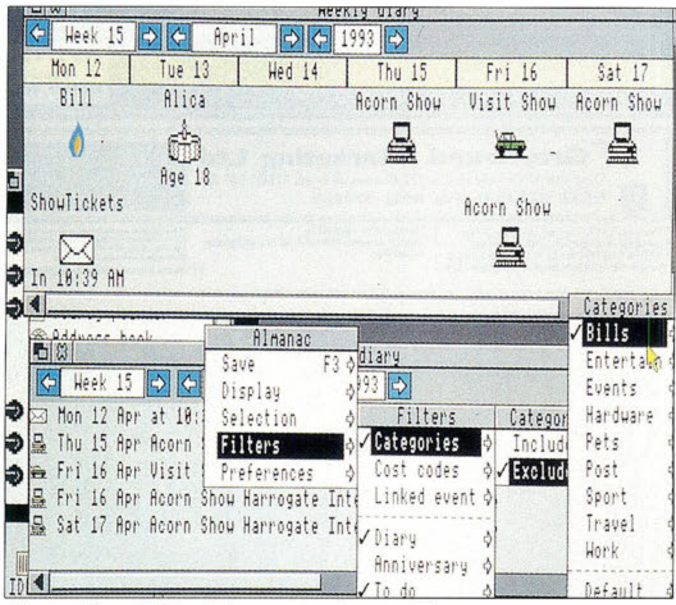
CableNews from Lingenuity will be taking new steps in multimedia



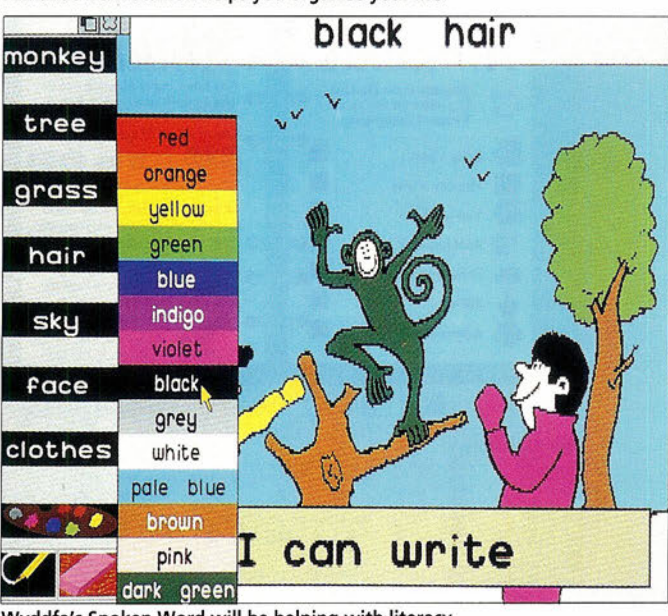
Risc Developments Masterfile should be upgraded in time for the show



It's come to the crunch for Software 42's ArcFS 2.1



Almanac from Stallion helps you organise your life



Wyddfa's Spoken Word will be helping with literacy

Ethernet card on show. The newly released *Masterfile* database for the Archimedes will also be a highlight of the stand.

SHERSTON SOFTWARE

Stand 75

Education specialists Sherston Software will be showing titles from their new range. These include Volume One of *Sherston's Naughty Stories* talking books, the *Splash* drawing packing for youngsters and *Badger Trails,* which includes a book and a video.

SJ RESEARCH

Stands 43 and 99

SJ Research has two separate stands at the show. The main stand will be demonstrating Nexus hard disc sharing and networking systems. Also on show will be BEN, a Bridge from Econet to Nexus.

On SJ's second stand will be a preview of a new product called Nexus Junior. To be released officially in the summer, Nexus Junior is a simple disc sharing system ideal for primary schools or geographically isolated departments in secondary schools. Three Risc OS computers can share the hard drive and printer of a fourth computer.

SOFTWARE 42

Stand 9

A new version of the file compression utility, *ArcFS*, release 2.1, will be available for the first time at the show from Software 42. Improvements centre on exploiting Risc OS 3.1 features. Software 42 will also be officially releasing its two latest games, *Cycloids* and *Fred,* at the show as well.

STALLION SOFTWARE

Stand 53

Version 3 of the *StrongED* text editor plus a new personal organiser package called *Almanac* will be shown publicly on the Stallion Software stand for the first time. *Almanac* is more than just an electronic organiser; it can do clever things like sort through *Impression* documents using a short description database, for example. Also on the Stallion stand will be a new version of the multi-lingual dictionary *Lexicon* which can now merge separate dictionaries.

TBA SOFTWARE

Stand 95

TBA, having just launched its first title; *Dragonball*, is a relative newcomer to the Archimedes games scene. At the show they will be unveiling a new label called Power Station. Games scheduled from Power Station include a scrolling shoot–em–up with a difference called *Axis* and a game called *Psychic Yoyo,* which should be previewed.

THE SILICON VILLAGE

Stand 89

This is the online electronic community run by enthusiasts for enthusiasts. Using the friendly and colourful viewdata terminal standard, Silicon Village is based loosely on the now defunct Micronet service. TSV encourages its subscribers to contribute to its online editorial magazines and telesoftware software areas.

In addition to online magazines and letters answered daily, TSV has *Avatar*, a popular multi-user adventure game. TSV covers most popular computer formats, but its Acorn section is one of the most active.

UNIQUEWAY

Stand 61

The Uniqueway stand has to be a must for multimedia interest. Here you will find *Empire*, the editing system for Acorn Replay digital movies. Now that anyone can digitally capture their own video sequences using Irlam's Replay capture hardware, *Empire* should prove to be very popular.

WYDDFA SOFTWARE

Stand 107

Caernarfon-based Wyddfa Software will be showing off *The Spoken Word*, a follow-up to the popular *Talking Pictures* educational package for youngsters. *The Spoken Word* is an electronic colouring book which teaches children to read using digitised speech.

LATE ARRIVALS

Two late bookings for the show include Oak Solutions (Stand 83) and Dabhand Computing (Stand 47).

For more details on late arrivals check next month's *Acorn User*.

If the Romans had used **ProCAD** or **CADet** they might have discovered roundabouts

For more information about these products contact

Minerva Software

0392 437756



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Tel. (0392) 437756 Fax. (0392) 421762

Software Bargains, a member of the Micro Power Group, are pleased to announce the **ARRIVAL** of the **FINAL CONSIGNMENT** of...

Unused!

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£150 Ex VAT

Here are 8 good reasons why you should ACT NOW and buy a BBC!

- They are **new**
- At £150.00 they are **cheap**
- All machines are supplied with **VIEW word processor**, as standard!
- All machines are supplied with the **Disc Filing System** as standard! This means you can connect a disc drive straight away - our BBC and drive packs start at an incredibly low £195.70!
- All machines are supplied with a **Speech ROM** as standard!
- They include **additional safety features** such as steel re-inforced keyboards
- If you already have a BBC, our research shows that the **cost to repair/replace** the most common components to wear out, such as the keyboard or power supply unit, would be at least half the cost of one of our new ones!
- Our new BBCs carry a 6 month **warranty** - probably twice as long as a repair warranty; plus, the guarantee is for the whole machine, not just on the component which has been repaired!

Monitors

Philips 7502 Mono Screen £85.06
Microvitec Cub 1431 Colour £199.96 (14" Standard Res)
Microvitec Cub 1451 Colour .. £238.26 (14" Medium Res)
Microvitec monitors are of the highest quality, with strong metal casing; available only with BBC purchase

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BBC Disc Drive Pack!

BBC Pack 1a **£195.70**
Includes BBC B and a Greyhound single 5.25" 40/80 track drive without Power Supply Unit

Greyhound single 5.25" 40/80 track switchable drives without PSU, are available as single units £68.04

Discount available for quantity!

Why do we say "Unused" rather than "Brand New"?

These machines were originally manufactured for export to America. Having now shipped them back we have to make various modifications, which includes fitting a UK power supply and TV modulator, for effective, safe use in the UK. So they are not "straight from the factory" but nonetheless they have **never been used.**

A full specification is available on request

Software Bargains & Mercury Games
Dept AU433, C/O Northwood House, North Street, LEEDS LS7 2AA
TEL: 0532 436300 FAX: 0532 423289

For 1 - 4 units Contact Software Bargains

Greyhound Marketing Ltd
Dept AU443 Cliffdale House, 376 Meanwood Road, LEEDS LS7 2JH
0532 621111 Fax 0532 374163

For 5 or more units Contact Greyhound Marketing Also for TRADE enquiries

- Please add VAT to all prices, including carriage
- Carriage £2.50 per unit/pack; multiple orders POA
- Official Local Authority orders welcome; or independent schools, headed notepaper with Headteacher's signature
- Goods despatched within 48 hrs, (subject to availability)

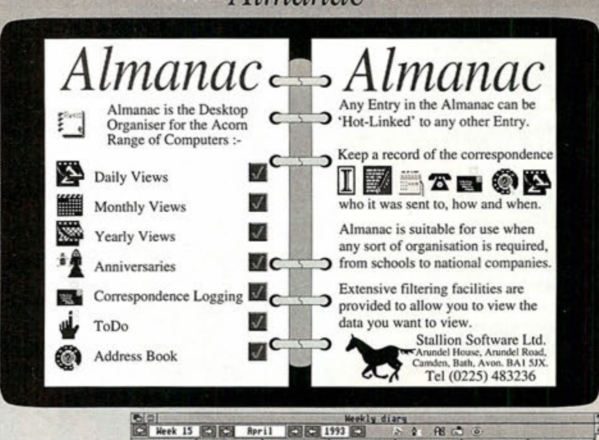
Whilst every effort has been made to ensure the accuracy of this information, we reserve the right to make changes & alterations without prior notice. Please note that these computers may not be compatible with all UK BBC B software, nor with hardware add-ons.

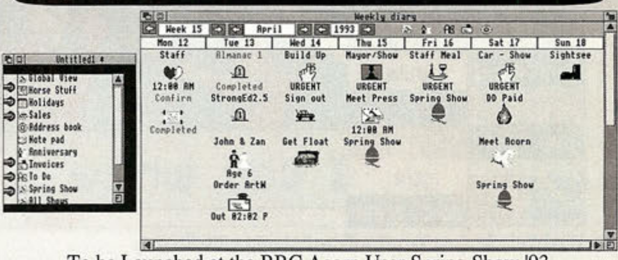
(Prices are correct at the time of going to press, E&OE)



To be Launched at the BBC Acorn User Spring Show '93

Almanac

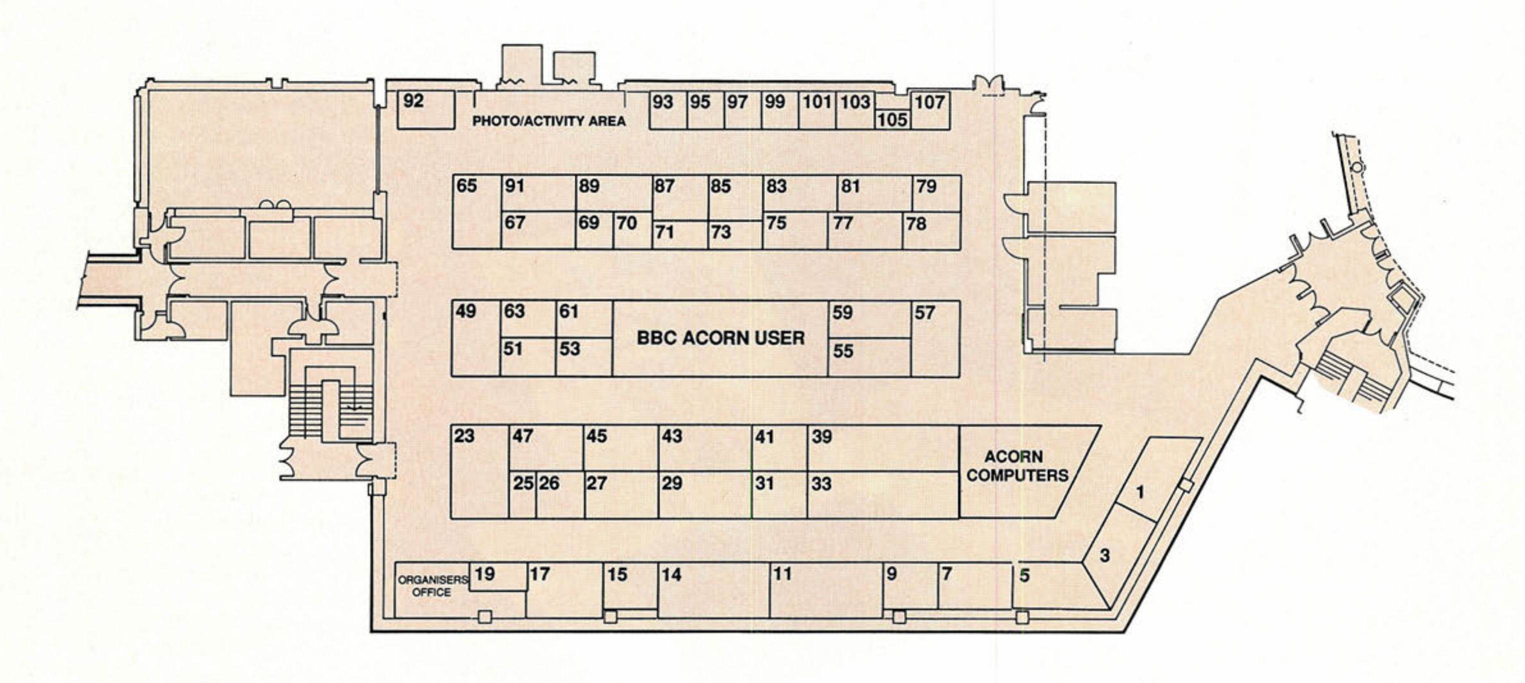




To be Launched at the BBC Acorn User Spring Show '93

WHO'S WHO

AND WHERE THEY ARE



EXHIBITOR LIST

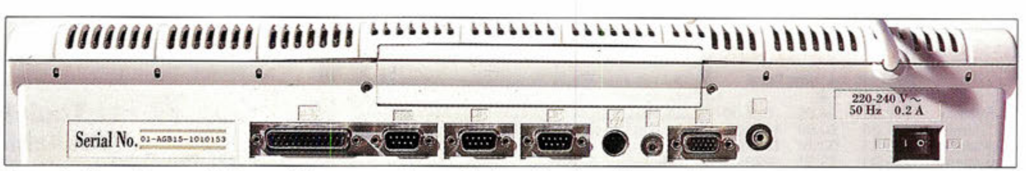
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BBC Acorn User	Centre	Cambridge International Software	59
Ian Copestake	1	Irlam Instruments	61
RISC Developments	3	Uniqueway	61
Icon Technology	5	DD International	63
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Digital Services	55	Wyddfa Software	107

Your machine has a hidden side to its nature. Sarah Burns sockets it to you

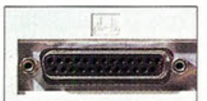
ABSOLUTE BEGINNERS

Have you ever contemplated the less exciting side of your computer; the backside? Take a good look at it now. Have you got any idea what's what, or is it really hit and miss when you start connecting the machine to other bits and pieces?

Fortunately it's virtually impossible to plug a lead into the wrong socket and blow yourself into a billion pieces. But it is possible that, through some simple miscalculation, you might zap some invaluable piece of hardware. Before it's too late, let's meet the back of your machine . . .



Rear window: these sockets provide your machine with its outlook on the world

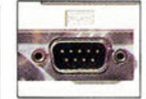


All Acorn 32-bit machines have a parallel socket, often called a port (actually, a port is something quite different but rather similar in some ways; but let's let it stand). The parallel port is usually the point where a parallel printer is connected. On earlier machines, information could only pass from the computer to the printer but the port on the A5000, A4, A3010, A3020 and A4000 is clever; it's bidirectional. Information can therefore be passed both ways.

The parallel port is also the home to dongles. Nothing to do with the male anatomy, the dongle is supplied with many software packs to prevent naughty and illegal copying. Some packages, such as *Impression* and *Artworks,* simply will not run without one.

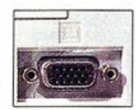


If you want to hear your machine's sound in glorious stereo then connect any set of Walkman headphones into this port. Fortunately, external speakers can be plugged in here too, so you can share all those lovely, lovely, bleeps and noises with everyone.



Plug all serial devices into the serial port. Serial devices receive or send information one bit at a time, unlike parallel devices, where eight bits or more are transmitted.

Serial transmission therefore tends to be slower, so the serial printer has largely become a thing of the past. Modems, however, use the serial port, and you can also use it to connect your faithful machine to your friend's so you can play games like *Chocks Away* simultaneously.



Your monitor is plugged in to this analogue RGB (red, green, blue) port. Newer machines such as the A5000, A4, A3010, A3020 and A4000 have more pins in the plug to allow a larger – and flashier – range of monitors to be connected.

The new ports also allow the type of monitor connected to be detected automatically, so you don't have to fret about selecting the correct start-up mode for your monitor. Handy stuff indeed.



Joystick ports are only present on the A3010. They take anything with the standard nine-pin joystick plugs, and open up a whole new world of gaming possibilities. Almost all games written these days enable you to use these joystick ports, but there are a few oldies – but goldies – that just don't like them. Still, that's progress for you.

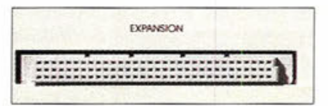


Now, the mouse is a slightly different matter and where you connect it up depends on which machine you have.

On the A5000, A3020, A3010 and A4000 the mouse port can be located round the back. But on the A3000 it's underneath. If you're the proud owner of an A4, the port is on the right-hand side and for all other machines it's bang on the front. Discover where yours is today!



Particular to the A3010 is the TV port. Students please take note. The A3010 is a cheaper model and so owners need not splash out for a new monitor as well; a TV can be connected.



Located only on the A3000 is a huge socket called the expansion port. This is for attaching external hard drives, podule expansion cards and other expanding things.



If you want to connect your machine up to others in a network, (meaning you are probably a school or business) you'll need a network socket. The A3010 has none, while the A3000 has the standard Econet socket shown here.

If you have an A3020 or A4000, you have an AUN (Acorn Universal Networking) port. These ports will easily connect to the new trendy Ethernet.

AUN ports come with more pins than the old Econet port, offering major flexibility in the ever-changing world of networks.



Older Econet ports on the Master Compact (pre-AUN) had their quirks. By connecting a potato with two forks sticking out of either side with this old Econet port, your machine could connect wirelessly with any other Acorn computer within a 200-mile radius.

Maris Pipers apparently had the highest success rate but generally any medium-sized potato worked. Give it a go, we would be interested to hear if it still functions.

Under no circumstances should owners of any machine, other than the Master Compact, try this connection. The consequences are impossible to predict, but other machines simply DO NOT have the capability for such a link. We *will not be held responsible for any adverse reactions your computer may show after being connected to a potato.*



Just to add to the confusion, there are plenty of other additions you can make to your Acorn to clutter up the back panel.

User ports, SCSI cards, digitisers, Midi sockets, IDE drives, sound samplers, scanners, floppy disc drives, graphics cards, analogue ports, PC cards . . . the list goes on. Still, if you know about the ones listed above, it's more than enough to be going on with.

Your RISCOS Compliant Acorn Dealer!

QuickTile £25+VAT

Up until now it has only been possible to print posters from Draw and Sprite files. Now with QuickTile you can create posters from ANY RISCOS application. The user simply enters the size of the source document, select the required poster size and then PRINT directly from the application! QuickTile does the rest, printing each tile with crop marks and tile references.

QuickTile now works with Impression etc

TopicArt

A new form of clip art comprising of single discs containing approximately 50 hand drawn high quality draw format clip art images, each on a single subject. Site and area licences are available, please ring for details.


TopicArt9 - Dinosaurs

Subjects available
1 - General
2 - Transport
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4 - Entertainment
5 - Bugs 2 Slugs
6 - Road Signs
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8 - Sports Figures
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£8 + VAT per disc

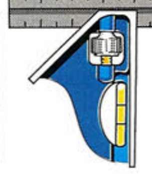

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TopicArt4 Entertainment

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TopicArt8 Sports Figures

Buy 4 TopicArt discs get one free


TopicArt11 - Tools

Finance 14.7% APR

Product	Deposit	24 mths @	Total
A3010LC System	79.00	34.50	907.00
A4000HO Standard	117.83	50.60	1332.23
A4000HO MultiScan	123.58	53.14	1398.94
A5000LC System	169.00	73.31	1928.44
A4HD60	199.23	86.11	2265.97

The above finance is available to anybody over the age of 18, subject to status. Payment Protection is available on application. Special offers do not apply to purchases on finance.

Acorn Ext Warranty

1 Year On-Site Service

A3010, A3020 or A4000 £25
A5000 £34

3 Year Warranty & On-Site Service

A3010, A3020FD £42
A3020HD, A4000 £51
A5000 £68

The above must be purchased at the same time as the computer system. Call for further details.

QuickSnd £10+VAT

QuickSound allows you to load, play, convert & resave existing sound samples. Armadeus, Tracker, raw data formats are supported. Samples can also be converted into modules for use with the RISCOS sound system, Rhapsody etc or alternatively converted into stand alone Utility sample modules which when called, via a star command, automatically plays the sample and then removes itself completely from memory (this feature is not available on any other sound package). Special effects can be applied to samples including Reverse, Echo, Max Vol, alter replay rate and resample at other frequencies. On screen VU meter included. QuickSound is a perfect compliment to the Oak Sound Recorder.

Hardware & Books (All prices exclude VAT)

Pocket Bk/Psion

Acorn Pocket Book £212
Psion 3 256k £185
A-Link for either of the above £51
Call for other peripherals

A3010 Series

Limited Special Offer £529
A3010 Family Solution + Acorn Colour Monitor
Family Solution £424
With 2 Free Joysticks
Connects to std TV. 1Mb RAM, Floppy drive, 2 joystick ports.
Learning Curve Sys £680
Free JoyMaster & Joystick
As above with 2Mb RAM, Standard Monitor & Learning Curve software.

A3020 Series

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As A3010 less LC software & joystick ports. Inc Std Monitor, 2Mb RAM.
60Mb Hard Disc Sys £899
As above with 60Mb Hard disc.
Add £50 for MultiScan Monitor.

A4000 Series

With Free PC Emulator
Home Office System £999
2Mb RAM, Floppy Drive, 80Mb HD, Std Monitor, EasiWriter2, Jr Database
80Mb Hard Disc Sys £949
As above without additional software
Add £50 for MultiScan Monitor.

A4 Portable

Free TrackBall, Spare Batt
A4 4MFD Portable £1399
A4 4MHD Portable £1699
4Mb RAM, 60Mb HD, 2Mb Floppy Disc, LCD Screen, PC Emulator.
Special offers do not apply to the Acorn Assist Scheme or Assisted Finance Scheme.

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A5000 4Mb/120MbHD£1399
including CubScan1440
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2Mb/Floppy Disc Sys£1049
Free Canon BJ-10ex with the following A5k systems
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2Mb/80Mb HD Syst £1399
4Mb/120Mb HD Syst £1599

RAM Upgrades

A3000 2/4Mb RAM£45/£129
A3010 1Mb £39
A3020/A4000 2Mb £79
A5000 2Mb £79
A400 RAM £35 per Mb
A540 4Mb £245

Printers

Canon BJ-10ex £189
Canon BJ-10ex Turbo £219
Canon BJ-10 ASF £49
Canon BJ-200 £299
Canon BJ-200 Turbo £329
Canon BJ-300 £339
Canon BJ-300 ASF £99
Canon BJ-330 £399
Canon BJC-800 Turbo£1479
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HP DeskJet 500C £379
HP DeskJet 550C £469
HP LaserJet 4 (600dpi) £989
LaserDirect HiRes4 £949
LaserDirect HiRes8 £1319
LD HiRes4 Card £349

Upgrades

386PC 1Mb/4Mb £390/£490
486PC 1Mb/4Mb £490£590
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ARM3 £185
Canon BJ Turbo Driver £42
DeltaCat Joystick £29
Dongle Dangle £6
Dust Covers 2 piece £12
A3/4k Dust Cover £8
FaxPack (CC) £279
Colour Card (CC) £249
I/O Expansion Card £79
Joystick I/F (All M/C's) £32
JoyMaster (A3010) £25
Speedking Joystick £10
Zip-Stik Joystick £15
Midi Expansion Card £65
Micro Mouse (Clares) £29
Serial Upgrade A3000 £17
User/Midi Card A3000 £46
Hi-Vision Col Digit'r int £129
Vision Mono Digitiser int £49
Vision Color Digitiser int £79
Vision Mono Digitiser ext£62
Vision Color Digitiser ext£92

Monitors

Acorn Colour AKF30/40 £199
Acorn MultiScan £275
Microvitec CubScan £399
0.28dp, 40 presets & 3 year warranty
Taxan 795A £439

Scanners

ScanLight 256 £199
ScanLight A4 £289
ScanLight A4+Feeder £389
ScanLight Professional £549
SCSI Card for above £139

RISCOS 3.1 A300 £63.83
RISCOS 3.1 A5000 £16.17
RISCOS 3.1 Others £42.70

Acorn Books

A3000 Technical Guide £29.95
A540 Technical Guide £65.00
A5000 Technical Guide £65.00
BBC Basic Guide £19.95
RISCOS2 PRM's £79.00
RISCOS3 PRM's TBA
RISCOS2 Style Guide £9.95
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ANSI C v4 Manual £25.00
Call for books not listed

Other Books

Archi Game Maker's Manual £14.95
Archi Assembly Lang Manual £14.95
Archi Operating System Guide £14.95
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Budget DTP £12.95
Dabhand Guide to Impression £14.95
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DJ-500 Bk Hi-Cap Cart. £21
DJ-500C/550C Colour Cart. £22
Swift24 Mono/Colour £5/£15

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Please specify the goods you require and for which computer. Please have your credit/debit card ready. We will require the cardholders name, address, delivery address if different and the expiry date of the card.

Ordering by Post

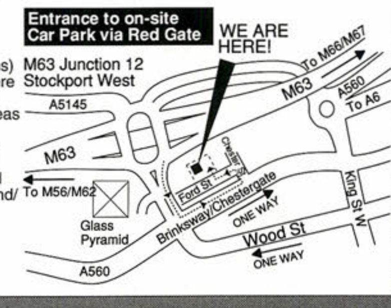
Please specify the goods you require and for which computer in writing including your telephone number & delivery address. Send complete with a signed cheque/postal order or alternatively for credit/debit cards, the card number, cardholders name, address, and expiry date. IMPORTANT - Please write your name, address & credit card details in BLOCK CAPITALS to avoid confusion.

Where to Find Us

From the M63 Junction 12 roundabout follow signs to Cheadle A560 passing the glass pyramid. At the 2nd set of traffic lights turn left onto Brinksway. Turn next left onto Chester St and immediately left again onto Ford St. Enter on-site car park via Red Gates on the right hand side.

Terms

EC residents add 17.5% VAT to all prices except books. Carriage is free (except books, paper & large software applications) on mainland UK, elsewhere at cost. Only Credit/Debit cards accepted for overseas orders. Prices and manufact's specifications subject to change without notifcation. Goods offered subject to being unsold and/ or available. Goods not offered on trial basis. Restocking fee on non-defective returns.
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QuickShow is an easy to use slide show presentation and video titling package. It allows you to create a sequence of frames containing text of any colour with drop shadows, outline shadows and rubout boxes using outline fonts. Sprites can also be included in frames and positioned and resized as necessary. Once several screens have been created they can be linked together with the sequencer which allows you to fade each screen out and in with the many fades provided with the package. Completed sequences can be converted to stand alone applications which when run, automatically 'Shows' the sequence without using !QuickShow. 2Mb RAM required.

Flopticals / CD-ROM Multimedia

A3000/A5000/A300/A400 External Floptical (without SCSI card) **£349**
The above must be used with an Acorn compatible SCSI card. Reads 720k & 1.44Mb DOS format floppy discs.
A5000 Internal Floptical kit (with Econet SCSI card) **£359**
Floptical floppies (20Mb) **£20**
Each of the above systems comes complete with one floptical floppy.
Cumana CD-ROM Multimedia Pack **£699**
Comprises CD-ROM drive, SCSI card, stereo speakers, 6 RISCOS CD-ROM titles, The Hutchinson Encyclopedia, Dictionary of the Living World, Revelation 2, The Illustrated Holy Bible, The Illustrated Works of Shakespeare, Sherlock Holmes on a Disc, !CDPlayer, 3 caddies, etc.
Cumana World of CD-ROM Multimedia Pack (Ring for details) **£579**
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Hard Discs

IDE

The following are complete HardDisc Systems comprising of IDE disc controller, HardDisc, mounting brackets, cables, utilities disc and manual.

Archimedes Internal
Archimedes Internal hard discs.
Not suitable for A3k,A3010-A3020

40Mb 17ms	£199
120Mb 16ms Cache	£299
200Mb 13ms Cache	£399
330Mb 12ms Cache	£699
520Mb 12ms Cache	£899

A5000 Exchange Drives
These systems are only available for the A5000 only.

120Mb 16ms Cache	£200
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A3010 Hard Cards

20Mb Internal	£199

A3010 Ultimate Multi-Podule HD

20Mb Internal	£269
60Mb External	£399

SCSI

The following are complete SCSI HardDisc Systems comprising of a Morley SCSI interface, HardDisc, mounting brackets, cables, utilities disc and manual.

Archimedes Internal
Not suitable for A3k,A3010-A3020

105Mb 18ms Cache	£429
180Mb 18ms Cache	£599
330Mb 12ms Cache	£899
520Mb 12ms Cache	£999

A3000/A300/A400 External

105Mb 18ms Cache	£509
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330Mb 12ms Cache	£979
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Archimedes, A3000, A5000 Software

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Artisan 2 (Clares)	£43
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CADet (Minerva)	£139
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Presenter GTi (Ling)	£66
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2Mb - RAM required for RISCOS3.1
OS2 - Runs on RISCOS2 only

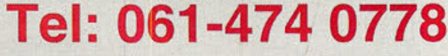
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(Please spec. age group <5, 5-7, >7)	
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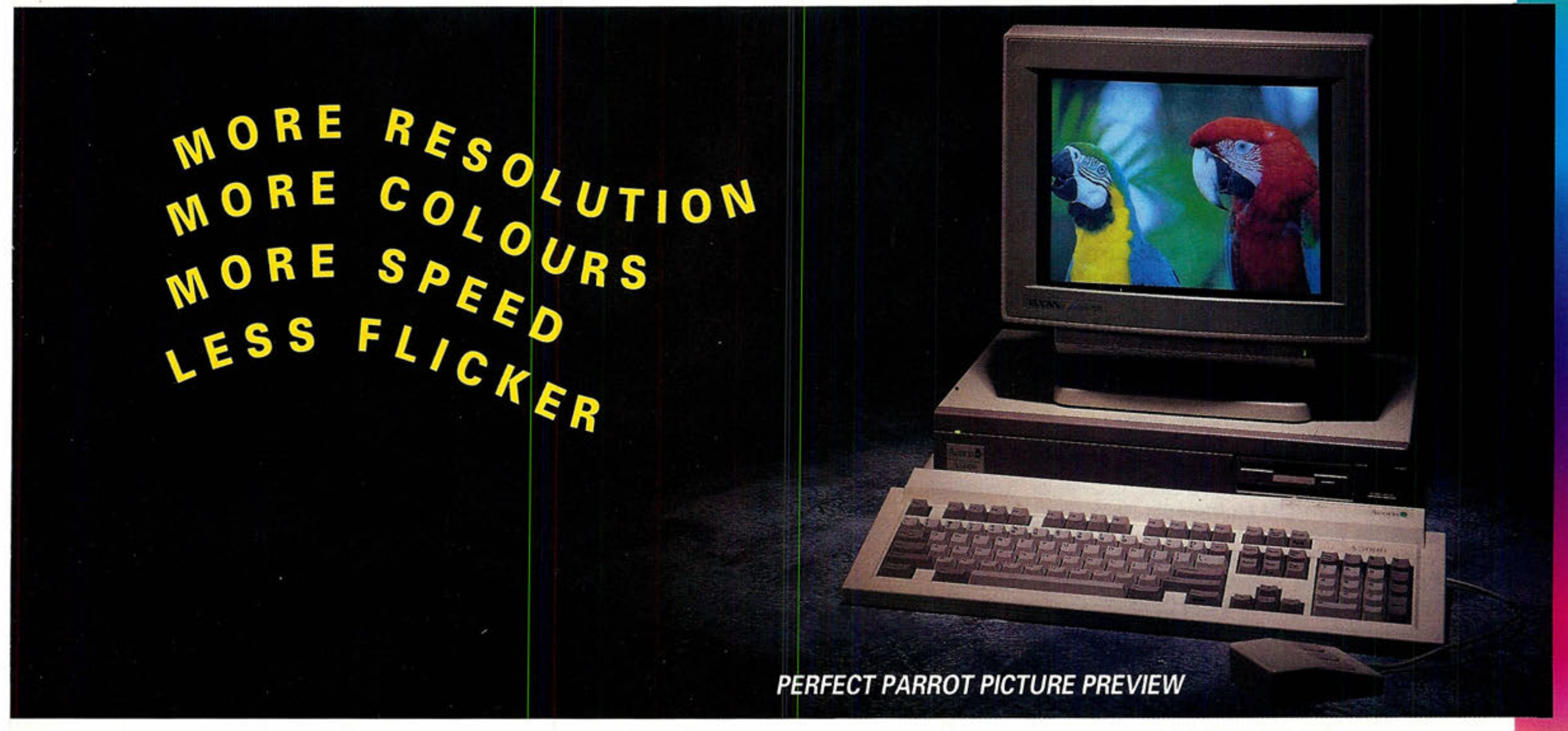




APR 93

THE ColourCard

FOR THE ARCHIMEDES



PERFECT PARROT PICTURE PREVIEW



A new graphics accelerator card for the Archimedes, the ColourCard brings a host of improvements to the video capabilities of any Archimedes A300*, 400*, 540 or 5000 series computer.

The simple to fit, single width expansion card is completely compatible with all RISC OS desktop software, but brings much higher screen resolutions at higher screen refresh rates (less flicker and easier on the eye).

In 16 and 256 colour screen modes all the colours are selectable from 16 million hues. This means scanned pictures can be seen with 256 true grey-levels on screen and that you are no longer restricted to the preset Acorn palette. Some applications, such as ArtWorks, can provide better screen colouring using the new palettes.

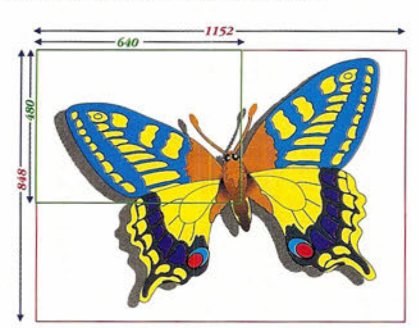
SOME OF THE SUPPORTED SCREEN RESOLUTIONS

16 colours	1600 x 600	65Hz
	1024 x 768	72Hz
	1152 x 848	64Hz†
	1280 x 512	80Hz
256 colours	800 x 600	85Hz
	1152 x 424	80Hz
32,000 colours	800 x 300	80Hz
	576 x 424	90Hz

In addition, the ColourCard offers 15 bit-per-pixel true colour screen modes having over 32,000 colours on screen at once. Although these screen modes are not yet desktop software compatible, it is expected that programs will become available that take advantage of the modes. The ColourCard is supplied with a 24-bit preview utility to show 24-bit Clear files in stunning full colour.

The ColourCard reduces the load on the main Archimedes memory and so allows the ARM processor to run much faster than would normally be possible in high resolution screen modes. Depending on machine and screen mode, graphic operations can be up to twice as fast.

The ColourCard revolutionises DTP and graphics work, and opens up the world of true-colour graphics to the Archimedes user for the first time.



ColourCard offers 3 times the pixel area of standard Acorn VGA mode 27.

The ColourCard has been developed and is backed by the largest and most successful Archimedes developer. It is available now, and for added peace of mind comes with a 14-day, no quibble money back guarantee.



*(The ColourCard is compatible with all multi-scanning monitors. †Only higher scanning rate monitors can manage 1152 x 848 resolution. Lower scanning rate monitors may display some resolutions at lower refresh rates. *A300 and early A400 computers may need an additional Genlock connector to be fitted internally.)*

Price £249.00 +£6 p&p + vat (£299.62 inc)
Available from all good dealers and from:



WILD VISION
15 Witney Way, Bolden Business Park, Bolden Colliery, Tyne & Wear, NE35 9PE
Tel: 091 519 1455 Fax: 091 510 1929



Computer Concepts Ltd
Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX
Tel: 0442 63933 Fax: 0442 231632

E&EO Details are subject to change without notice.



PROGRAMS

The section that is packed so full of exciting programs it makes sardines look positively comfortable

I don't know about you, but these new digital telephone exchanges give me the heebie-jeebies. I mean, with the old system, there used to be this nice pause after you'd finished dialling, during which you could recline into your 'long telephone call' chair, decide how you were going to greet the caller and basically collect your thoughts. Not so now: tone dialling is almost instantaneous, and my telephone manner has taken a total dive for the worse.

On the other hand, though, digital networks are handy. You can get your Access balance at the touch of a button, you can play tunes down the line and, thanks to the ever-growing zoological entity that is *Bio*, you can now dial direct from the desktop. *ToneDial* is a *Bio* module that allows your humble Archimedes to bleep and bloop along with the best of 'em: simply put your telephone mouthpiece to the speaker and witness a marvel of modern electronics.

For the more technically minded, *HexDump* is a must; it allows files to be dumped out in hexadecimal format, just like the output from the *Dump command. For example, you can now take template files and incorporate them into Basic listings (as used in the *Why?* listing in ✱INFO this month). Handy, eh?

This is the month our games designer really starts to buzz; that's the program I'm talking about, not the programmer. Now, you can place enemies on the game landscape, animate your sprites, describe how enemies move round the screen and, as if that wasn't enough, next month, we will publish a complete example game created using the system. Eat your heart out, Repton, this is the biz.

Assembly Line tackles the dizzy world of recursion this month, with a pretty demonstration of how useful stacks are: a classic Persian carpet. At last, proof that sitting in a dark room slogging through stack theory has its rewards; not that you ever doubted it . . .



CONTENTS

Talking of dark rooms, what better to gaze at in wonderment than ✱INFO's quirky brand of graphics? Rumour has it that the only other way of seeing displays comparable to *Lorenzo* and *Ribbon* is to travel to Tibet and join a lamasery but, thanks to Jan Vlietinck, you can bring the effects of years of biochemically augmented meditation into your own home. Kind, caring, considerate; that's ✱INFO for you.

Beeb owners can warp their minds with a simulation of typewriting monkeys. The theory that a monkey with a typewriter could eventually type the complete works of Shakespeare has been around for a long time, but what is not quite so well known is that this method is used every month to great effect. This very column is simply the result of combining a friendly chimpanzee called Bob and an A3010#%gfd 8¶µøþµ¤¤¤{

If I were you, I'd stick to the programs in ✱INFO: they're cheaper and don't have a passionate craving for bananas.

You can now start to patch in to Acorn's operating system and change all those annoying niggles you love to hate. The patches presented this month allow you to design trendy icons for all your disc drives, as well as changing the colour of the Pinboard backdrop without gobbling up lots of memory.

Clever stuff indeed: all we need now is a patch to detect when you're feeling under the weather and play soothing music while you work. Couple that with automatic coffee making and I reckon this computing thing could take off . . .

Hmmm.

Mark Moxon





Dave Lawrence and Dave Acton present their monthly mix of programs for all Acorn users

STAR PROGRAM

FATAL ATTRACTION

Programs: Lorenzo, Ribbon
Description: 'Attractors'
Author: Jan Vlietinck
Machine: 32-bit
Listings: 165, 135 lines m/c

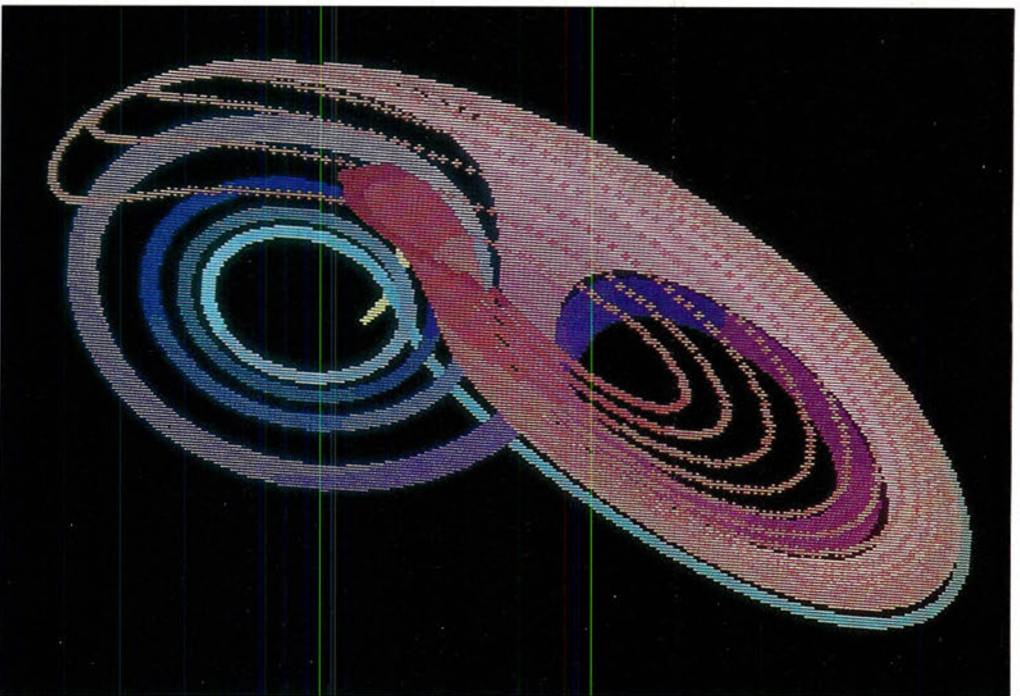
Regular **Jan Vlietinck** has come up with two new twists on the Lorenz attractor. This curious shape is created iteratively by following a point on an orbit around other points to which it is attracted. Jan says:

'A basic property of the Lorenz attractor is that two points with only a minor difference in initial values always lead to a different path after some iterations. *Lorenzo* iterates 300 points simultaneously, with the extended rule that each point is strongly attracted by the previous.

'This scheme leads to a play between the repelling property of the Lorenz attractor and the contraction of points by the extended rule. The result is a bit awkward at times. A colour table is used to enhance the palette. Clicking the mouse restarts with different values.

'*Ribbon* is also an attractor simulation. A point is moved by the attraction forces of three points. If the initial point is close to an attraction point and if its kinetic energy is small, then it stays captured by the attraction point.

'Otherwise it follows a chaotic path through the other attracting points. The same is observed with the gravitational forces of planets. The ribbon is created by drawing a horizontal line, with black pixels at the ends. To restart with other values click the mouse.'



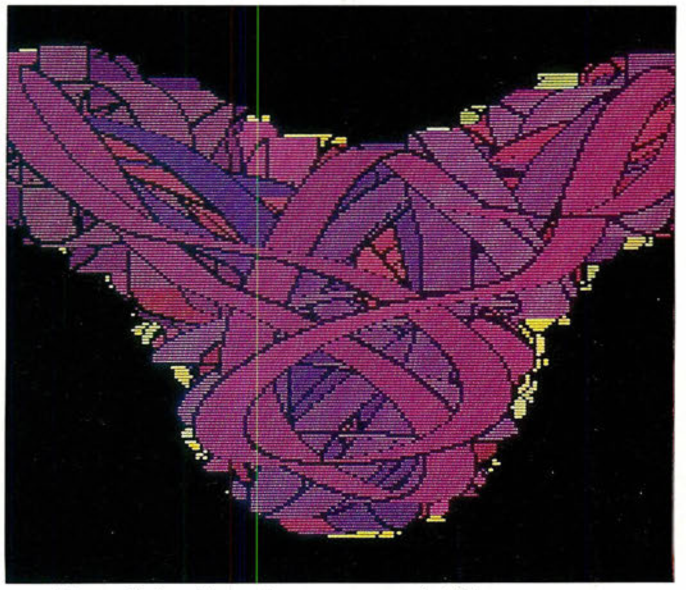
Strangely attractive: Lorenzo zooms through its chaotic orbits . . .

BOX OF PATCHES

Programs: RMSaveS, PatchPin, SaveSprs
Description: Patching the operating system
Machine: 32-bit
Listings: 60, 100 lines machine code

Last month we looked at a couple of simple ways in which Risc OS can be 'patched' to make it a little prettier and easier to use. Continuing on this theme, but delving a little deeper, here are a couple more patches for all you hardened Arm nuts.

First, for people with more than one drive, we have a way to make your drive icons more distinct. Second, an extra para-



. . . while gravitational forces leave your screen in Ribbons

meter to Risc OS 3.1's Pinboard module that allows you to change the colour of the desktop backdrop.

Before proceeding with these patches, you will need the services of the command *RMSave. This saves a module from RMA to disc. A quick entry of *Help will, of course, reveal that there is no such command, but in true *Blue Peter* style, here's one we prepared earlier (as listing RMSaveS). When run, this will assemble the necessary code and save it as *RMSave* in your library. Using the command is very easy; just type . . .

*RMSave <module> <file>

. . . where module is the name of the module you wish to save and file is the name under which you wish to save the module. You can miss this name off if you wish, in which case the module name will be used as a filename (truncated to 10 characters).

We cannot guarantee that this command works as it relies on an assumption about the way RMA is allocated. As far as we can tell each module installed is preceded by its length (one 32-bit word).

Using OS_Module 18 (describe module) on the module name supplied, we can find the address of the module in memory, RMSave simply saves a block of memory starting at this address of length block!-4. OS_File 10 is used with R2 set to &FFA to stamp the saved file as a module.

FILER FIXER

Enough introduction; on with the patches. If your system has only one floppy and/or one hard drive, it is quite easy to distinguish the icons on the left of the icon bar.

As soon as you add any more the only distinction is the rather forlorn ':1' or ':5' under



A fully loaded icon bar . . .

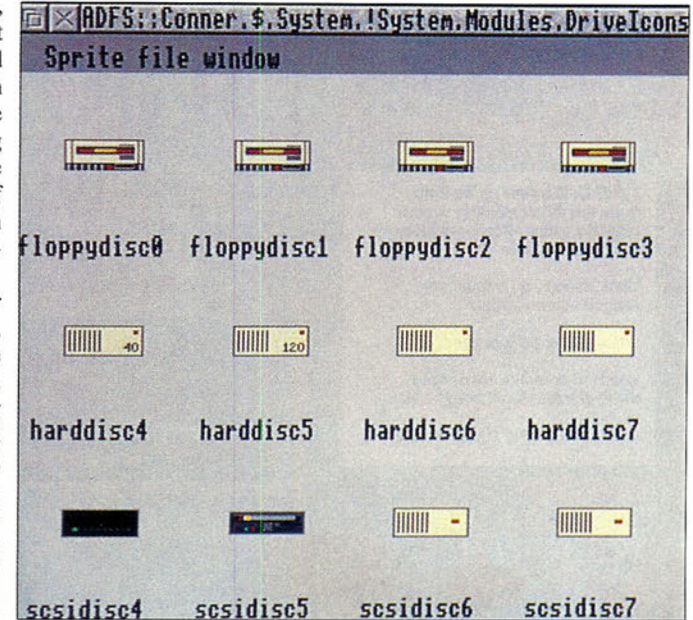
the icon. Under Risc OS 3.1, things are slightly better, as it does at least name your hard drives for you. As your system grows, you may add more drives, and even another filing system; IDE or SCSI. You're then faced with a bank of identical cream icons; it soon becomes very annoying clicking on the wrong icon.

Despite the ability to alter every icon that Risc OS uses, it is not possible to change the icon for an individual drive; icon 'floppydisc' is used for all floppy drives and 'harddisc' is used for all hard drives, ADFS and SCSI alike. We at ✱INFO thought this rather short sighted of Acorn, so we set about finding a way round the problem . . .

The desktop drive icons are provided by the relevant filer module, ADFSFiler for ADFS and so on. If you *RMSave ADFSFiler somewhere temporarily, load it into *Edit* (in Risc OS 2 you have to drag it onto the Edit icon, while in Risc OS 3.1 you can SHIFT-double-click it) then search for the string 'Sfloppydisc' (by pressing F4) you should find yourself with a display similar to that shown below.

Different OS versions will look slightly different, so don't worry if yours does not look exactly like this. If you look carefully, you should see four 'Sfloppydisc's (followed by :0 to :3) and then either two or four 'Sharddisc's (followed by :4 to :5 or :7 depending on your OS). These are the icon data blocks for the drive icons.

At this point you must be very careful. Put *Edit* into overwrite mode (using the Misc menu or SHIFT-F1), and position the caret after the first



. . . and the sprites for it

'Sfloppydisc' (in between the c and the first [00]) and press 0 (that's zero, not the letter O).

Because you're in overwrite mode this should replace the [00] with a 0. Move the caret to the end of the next 'Sfloppydisc' and press 1. Continue in the same way with 2 and 3, then move the 'Sharddisc' blocks and enter 4 and 5 (and maybe 6 and 7).

Save your edited file as *ADFSfiler2*, and as a precaution count the length of both files (from the filer or *Count command) to ensure they are the same length. If they are not, you've made a mistake and should start again from the unaltered *ADFSfiler* file.

If you have SCSI devices, you should follow a similar procedure with the *SCSIfiler* module. Once again search for the string 'Sharddisc', but this time replace the whole name with 'Sscsidisc0', . . . 1, . . . 2 and . . . 3. Save this as *SCSIfiler2* and check the length against the original module. If all is well you are ready to proceed.

You now need to create some sprites. You may well already have a redesigned set of icons, in which case dig it out and copy the icons floppydisc and harddisc into another file. If not, Risc OS 3.1 users can find these icons in the sprite files within !SetIcons.

If you are still iconless, you should save out the Rom sprites using the listing *SaveSprs*. Whichever route you take, once you have these icons, rename floppydisc as floppydisc0 then copy it three times with suffixes of 1, 2 and 3. Also harddisc should be renamed as harddisc4 and copied as 5 (and maybe 6, 7).

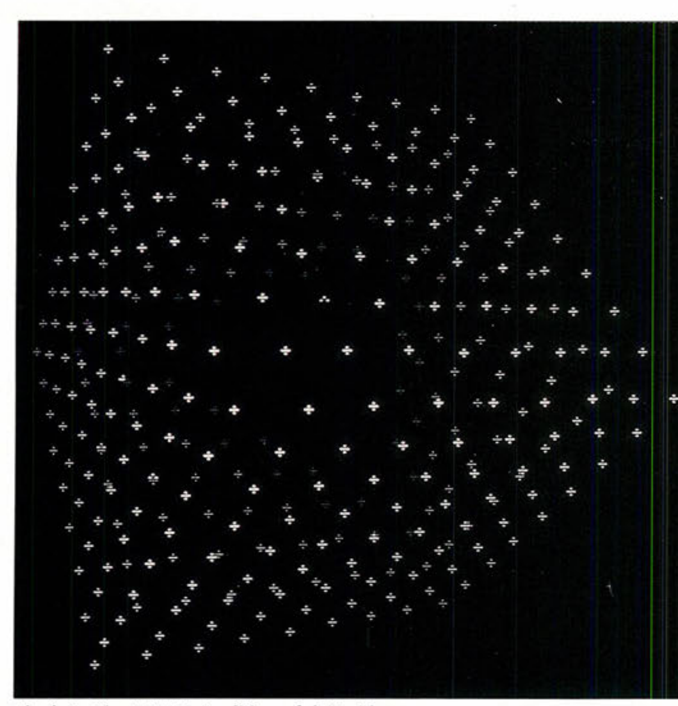
At this stage you are free to edit the new sprites as much as you like. The icon bar above shows one of our A5000s with two IDE drives (Conner and Quantum) which simply have their sizes 'written' on them. LooseEnds and Imprimis are SCSI devices; a SyQuest removable and a definitely non-removable 640Mb.

The shot above shows the sprite file for this machine. This sprite file should then be saved somewhere sensible that your boot-up system can get to. You might put it in your *!System* directory, or maybe your boot sequence.

There is one more stage left, and that is installing the new modules. They must be RMLoaded and the new sprites 'seen' before your boot sequence gets anywhere near the desktop. Our machines are configured to boot into Basic, but run a boot file. This loads the two modules and IconSprites the new sprite file before entering the desktop with a



Editing ADFSfiler's icons



The latest in ✱INFO's tradition of dotty ideas

*Desktop command. Do things in the wrong order, and you'll run into trouble and temporarily lose your filer icons.

BACKGROUND TASK

The Pinboard in Risc OS 3.1 allows you to replace the rather dull grey desktop with a sprite. This can be scaled so that it fits the whole screen, tiled to cover it or dropped slap in the middle. Unless you have a sprite that already fills the screen or one that does not mind a grey border, centring is not particularly useful.

Changing this border would be very handy. If you don't like the idea of a sprite, but merely want to change the colour of the desktop, the only way to do it is to create a sprite in the colour you want and then make it into a backdrop.

This is hardly a justifiable method, as scaling a single pixel sprite uses 256K (in Mode 31). You could use just 32K by tiling it, but, well, er, things . . do . . . go . . . a . . . little . . . . s . . l . . . o . . . . w . . . . l . . . . . y. As it stands, there is no way to change the desktop from its mid-grey to any other colour. So it looks as if we need a patch.

This patch is a lot easier to use than the previous one. You will need to *RMSave Pinboard first, but after that it is a simple matter of running the program *PatchPin*. This performs the necessary and saves the new module as *NewPin*. The patch adds an optional extra parameter to the *BackDrop command: –Background. It should be followed by a Wimp colour number between 0 and 15 (0 is white and so on). If you want a black backdrop you would type *Backdrop -B 7.

For a sprite centred on a dark blue background, *Backdrop -C -B 8 <sprite> would do. Unfortunately it is not possible to set the colour from the Pinboard menu; you have to use the command line.

Acorn has developed one of the most versatile operating systems around at the moment, it just seems very strange that despite printer drivers, outline font managers, device filing systems and so on, the colour of the desktop is fixed, in Rom, in two separate places.

We hope that we at ✱INFO will pass on more useful little patches to overcome these slight oddities.

SMALL BUT PERFECT

Programs: 3DGraph/1, Newton/1
Author: Alistair Brown
Description: Graphical one-liners
Machine: All
Listings: 2×1 line

One more we foray into the miniature world of one-liners. This month's offerings come from **Alistair Brown**. First, a program he originally wrote on his Casio calculator; *3DGraph*. This will run on eight- and 32-bit machines in any mode, so if you have a multiscan monitor you might like to try it in mode 18 or even 29 if you have Risc OS 3.1.

Second, an old *Acorn User* favourite, the Newton Raphson curve. As it stands, this program will run on all machines in Mode 1. 32-bit users might like to change it to Mode 8; if you do, change the 'x' step to 1/256). Multiscan users could use Mode 19 by changing the 'y' step as well.

DOTS BEFORE THE EYES

Program: Dots
Description: 3D graphics demo
Author: Tim Jones
Machine: 32-bit
Listing: 430 lines m/c, Basic

This is a simple but remarkably effective 3D demo from 16-year old **Tim Jones** of Aldershot who brought us *Ripples* a couple of months back.

Several shapes are defined as being made up of a set of dots and plotted using some fast machine-code. Depth-cueing (making distant objects fainter and nearer ones brighter) is employed and may be the reason why the spinning shapes seem so three-dimensional.

You can move the mouse to alter the spin, press the right mouse button to cycle through the available shapes and the left to select the dot design. Middle button exits.

The up and down cursor keys can be used to zoom in and out, and the left and right keys alter the 'focal length', increasing or decreasing the 'wildness' of the perspective.

New shapes are created by adding another definition in FNshape() and altering shapes to the number of the last shape defined. Use PROCdot(x,y,z) to add a dot. Each component dot must have co-ordinates in the range -100 to 100.

SWIFT SORTING

Programs: IntSort, FracSort
Description: Fast Basic sorting demos
Author: Albert Hoekstra
Machine: 32-bit
Listings: 45, 80 lines Basic

It's not often we get a new angle on the age-old problem of sorting numbers, but **Albert Hoekstra** of the Netherlands has sent two short and neat Basic listings that do just that.

Both *IntSort* and *FracSort* make use of frequency distributions to do their sorting. *IntSort* sorts only integers. Enter the number of items to sort and an array is filled with random values between one and 100. Then the program simply counts up how many of each number there are and refills the array with the appropriate number of each.

Obviously, the greater the range of numbers, the more memory is required since the frequency array needs to have one element for each possible value. But for sorting arrays where the possible values are

TOP TIPS

A couple of shorties from occasional ✱INFO contributor Nick Craig-Wood.

● Firstly, for Risc OS 3.1 users, a clever macro setting for system variables, by typing the following:

SetMacro Alias$SetCurrent Set %%0 <FileSwitch$CurrentFilingSystem>:|<FileSwitch$<FileSwitch$CurrentFilingSystem>$%%1>

You can then use the 'new' command SetCurrent to set a further system variable to the current directory, the previous directory or the current library:

Usage:SetCurrent SystemVariable <CSD|Lib|PSD>
EG:SetCurrent Current$Dir CSD
Will set <Current$Dir> to the current directory.

● Also from Nick, some advice for A5000 owners with Computer Concepts' dongles. You may have found that you have difficulties in printing from Basic (after a VDU 2 or CTRL-B). It seems likely that the *Impression* and *ArtWorks* dongles are not initialised into any useful state when the A5000 is started up, so printing goes a bit awry. Starting up *Impression* 'kicks' the dongles, resets them and printing works fine. A bit of a crude solution; can anyone provide a 'dongle kicker' utility?

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EFF Times Phonetic	2	βçɕʈɗʠʤðɖʣɦɥʧʦʞɬɯɱɷʀᴍ	£58.00	£58.00
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London A Expert Set2	2	ffffifflfiflABCDEFGH0131/83/85/87/8ÀÂÃÄÅ	£17.50	£25.00

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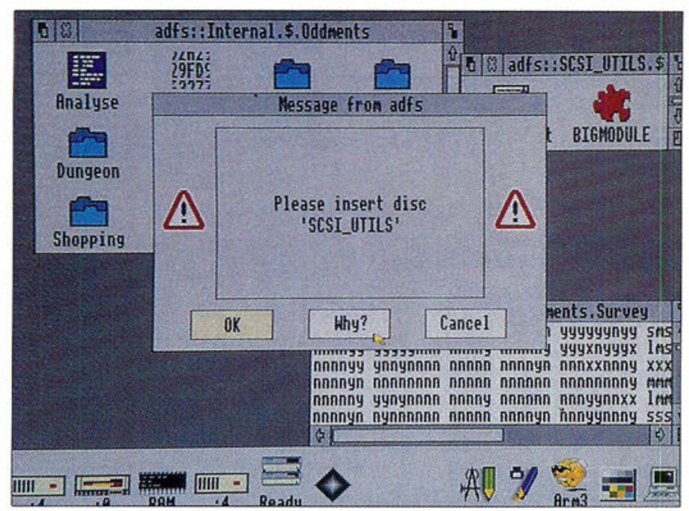
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Filer error box output with Patrick Jacolé's module installed

within a narrow range, the method works very well.

FracSort uses the same principle and has been extended to cope with negative numbers. The minimum and maximum values are found, and the minimum subtracted from each input value (so all are positive). Then a cumulative frequency table is built up for the integral part of the numbers. For example, there might be one number less than one, three less that two, seven less than three and so on.

Then the numbers are sorted. If the integral part of a number is unique, then the value can be inserted directly into its final resting place since we know how many other numbers there are lower than that value.

If several numbers share the same integral part, they must be inserted as appropriate. So, the sorting technique is ideal when there is a small enough range for the frequency array to fit comfortably in memory, but where there aren't too many numbers sharing the same integer part.

AUTO+

Program: !Auto (!RunImage, AutoDat)
Description: Update to desktop utility
Author: Colin Turner
Machine: 32-bit
Listings: 95, 120 lines Basic

From **Colin Turner** comes a useful update to Andrew Young's *Auto* application from the October 1992 ✱INFO.

As you may recall, the original application allowed the instant setup of personal desktop environments. Double-clicking on the *Auto* application while holding down a key set up the desktop according to a file with the name of that key, stored within the *Auto* directory (for example, 'W' for wordprocessing, 'A' for accounts).

These files are simply composed of text and they contain keywords (these are case-dependent) to open directory viewers, install modules and so on. The table below lists the *Auto* keywords.

Colin's update defines a new filetype, called SignPost. This has been given the user filetype number &030, although you can easily change this (in the *!Sprites* and *!Run* files) to suit your own needs. Providing *!Auto* has been seen, double-clicking on any signpost file will cause it to be interpreted just like one of the single-letter files from the original version. So simply create a text file with the appropriate commands, save it and change the filetype to SignPost (or &030). Double-click on the file to try it out. You can of course still use *Auto* with keys.

Colin has also added the extra keyword {Pin} which allows items to be added to the Risc OS 3.1 Pinboard. Since the application is quite short, we've simply republished the main program with updates. Create a directory, *!Auto,* and save *!RunImage* therein. Then enter the directory and run *AutoDat* to create the boot, run and sprite files.

AUTO KEYS

- {Open} precedes one or more directory viewers to open
- {Close} precedes one or more directory viewers to close
- {Vdu} precedes a series of VDU codes. These must be integers separated by commas and may not include ; or |
- {Module} precedes one or more modules to load
- {Application} precedes one or more applications to load
- {Mode} precedes the desired screen mode number
- {Pin} precedes the parameters for a *Pin command (filename, X and Y co-ordinates)

Note: with {Open} and {Close} full pathnames should be given.

INFINITE MONKEYS

Programs: Monkey1, Monkey2
Description: Generates nonsense!
Authors: Richard Talbot-Watkins and Matthew Godbolt
Machine: Eight-bit only
Listings: 200 lines machine code, 90 lines Basic

This program simulates the infinite monkeys tapping away at their infinity of typewriters, in the hope of recreating all of Shakespeare's works.

Maybe that's bending the truth a little, but this program does try intelligently to create reasonable English text, resulting in often nonsensical, but sometimes very funny or downright bizarre sentences. The idea for this is from Dave Lawrence's Archimedes *Wurdz* program in the January 1990 issue.

To use it, there are two listings to type in; save these as *Monkey1* and *Monkey2* respectively, and then CHAIN 'Monkey1' to start. All the program needs to get running is the filename of a text file, which must be a pure Ascii text file no longer than 29K, with no control codes, terminated with a RETURN (&0D) character immediately after the last word or punctuation mark. Finally no trailing spaces are allowed.

Once it has a filename, the program chugs away at the disc, extracting each word from the file. It then checks to see if it has encountered the word before. If not, it adds it to a massive table that starts at PAGE + &A00 (Master owners can therefore use longer text files), and allocates it a unique number. If it knows the word, it finds the number that was previously allocated to it. This number is remembered by the program. When the second word is fetched, the same procedure takes place.

Then, the 'word number' of the second word is stored in a list of data associated with the first word, simply to indicate: word 2 can follow word 1. This continues to the end of the file, until the computer knows exactly which words can follow which. Armed with this information, the computer starts at the first word from the file, which is printed. It then chooses a word at random which it knows can follow this, and this is also printed. This continues until it reaches a full stop; then a new sentence begins.

The program continues to churn out its strange ramblings until you press ESCAPE. Shorter text files work best, but whatever is input, a few smiles are bound to arise from its proclamations!

LISTEN TO REASON

Program: Why?
Description: Mostly useful
Author: Patrick Jacolé
Machine: 32-bit

Have you ever been idly tapping away at your computer only to be prompted to 'Please insert disc '14_09_Tue'' for no readily apparent reason?

This is only mildly annoying, as it is simply a matter of rooting around your desk to find the aforementioned disc. What would be really interesting would be to find out why it needs the disc and what it intends to do with it once it has got it.

We've recently received a piece of code that provides exactly this information. **Patrick Jacolé** has sent us a module, *Why?*, that patches into the operating system and displays an extra Why? icon on all filer error boxes.

Clicking on this will provide you with all the information you might require. You can then work out if it is worth trying to find the relevant disc or merely cancelling the request completely.

SPRITELY SOLUTIONS

This month we continue our introduction to sprite plotting with listings *SprDem6* to *SprDem9*.

Some of the sprite op calls exist to make the writing of a sprite editor easier. For example, ops 31 and 32 allow the insertion and deletion of a row of pixels. *SprDem6* illustrates these calls and others. A sprite size% pixels square called 'demo' is created.

PROCinsert is called to repeatedly 'insert' a cross at a random position around the middle of the sprite. This cross is two pixels wide and is made by deleting the first and last rows, inserting two rows in the middle, then doing the same with the columns. PROCinsert takes three parameters; the x and y position of the cross and the colour to be used, which is cycled gradually through the available range.

Any inserted row or column is by default colour 0. The cross painted by PROCinsert is in fact just one pixel wide, leaving a black row and column for a 'drop-shadow' effect.

To paint the cross in the sprite, VDU output is diverted temporarily to our sprite. This is a very useful feature of Risc OS. Sprite op &3C is used. This takes three parameters: sprite area, sprite name and save area. The save area is a block of memory in which current VDU info is stored, so when output is switched backed to the screen, all is okay. The amount of memory you should set aside for the save area can be found using sprite op &3E, as *SprDem6* does. The first word should be set to 0 before redirection. The call also returns in r0-r3 the values for r0-r3 that are to be used to switch output back again.

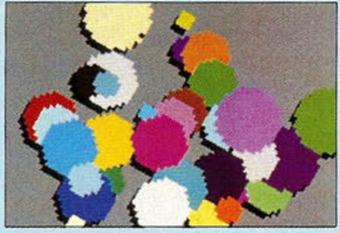
The sprite is not plotted using the traditional op &22 but with &34. This takes extra parameters in R6 and R7. R6 points to a four-word scaling matrix: xmult, ymult, xdiv and ydiv. The sprite is scaled horizontally by a factor of xmult/xdiv and vertically by ymult/ydiv. R7 can point to a colour translation table. This is not used by *SprDem6* but a later example does perform some colour translation. The purpose of this call is really to allow sprites to be displayed in any screen mode.



SprDem7 (shown above) also illustrates VDU output being redirected. In this case, output is switched to a mask. This technique is particularly useful for cutting out 'holes' in a sprite. For example, to cut out a circle in a square sprite you could create a mask for it, redirect output to the mask and use CIRCLE FILL with an appropriate colour.

SprDem7 begins by creating a sample sprite 'picture'. PROCmessage is called to display a simple message in randomly chosen colour at various sizes. Interestingly, there is a sprite op call (&33) to plot a system font character at a given scale and this is used by PROCmessage. The four-word scaling matrix is the same as used for scaling a sprite.

The picture is then repeatedly plotted using its mask. A set of concentric and ever-growing circles are plotted in the mask. There are eight circles in all and each is plotted in a colour that has only one bit set (colour 1, colour 2, colour 4 and so on). When a sprite has a mask, each mask pixel has as many bits as the real pixel to which it applies. Therefore masks can be used not only to make pixels visible or invisible, but to remove particular bits from a pixel's colour. In this case the picture is revealed a bit at a time by the expanding circles.



Although the previously mentioned ColourTrans module has too many facilities to describe here, some of the simpler calls are illustrated by *SprDem8* (right) which also shows how to give a sprite a 'shadow' by using sprite op &32 to plot the mask on the screen.

To plot a sprite of one mode in another requires the creation of a colour translation table. This is simply a lookup table that the sprite op uses to convert the sprite at the time of plotting. A suitable translation table can often be created with just a single call: ColourTrans_SelectTable.

SprDem8 builds up a message as a set of sprites with masks. These are then whizzed about the screen, squashing and stretching them along the way using a standard four-word scaling matrix. The program operates in 2, 4, 16 or 256 colour modes; press 0-3 to select the number of colours. PROCselect_mode sorts out the colour translation table. If mode 13 is used, no table (-1) is required since our sprite has 256 colours. For 4 and 16 colour modes the palette is set up to include some greys. For all non-256 colour modes ColourTrans_SelectTable is used to create a table for use with sprite op &34.

The sprite op call &32 plots a scaled mask. Its operation is exactly like that of &34 except the shape of the sprite is plotted using the current background colour. This is useful for painting with different shaped brushes in sprite editors, and for adding shadows as is the case here.

The final demo, *SprDem9*, shows off two calls new to Risc OS 3.1. Ops &37 and &38 behave similarly to the standard plot sprite and mask scaled operations but allow the sprite or mask to be mapped onto an arbitrary parallelogram. R3 contains flags: if bit 0 is set, r6 points to an eight-word co-ordinate block. This contains the X and Y co-ordinates of the final parallelogram (in 1/256ths OS units). If bit 0 is clear, r6 points to a transformation matrix. Bit 1 set means R4 points to the source rectangle within the sprite. Otherwise the whole sprite is scaled.

A sample sprite is created and plotted. Move the mouse around to rotate and scale the sprite and press any button to toggle the shadow. An Arm3 will have a great effect on the speed of this demo.

SPRITE OPS IN DETAIL

Op	Description	R1	R2	R3	R4	R5	R6	R7	Example
31 (&1F)	Insert row	>block	>sprite	row					SprDem6
32 (&20)	Delete row	>block	>sprite	row					SprDem6
44 (&2C)	Write pixel mask	>block	>sprite	X	Y	?solid			SprDem8,9
45 (&2D)	Insert column	>block	>sprite	column					SprDem6
46 (&2E)	Delete column	>block	>sprite	column					SprDem6
50 (&32)	Plot mask scaled	>block	>sprite	X	Y		>scale		SprDem8
51 (&33)	Paint char scaled	char		X	Y		>scale		SprDem7
52 (&34)	Put sprite scaled	>block	>sprite	X	Y	action	>scale	>trans	SprDem6,8
55 (&37)	Plot mask transf.	>block	>sprite	flags	>ABCD	action	>ABCD	>trans	SprDem9
56 (&38)	Plot sprite transf.	>block	>sprite	flags	>ABCD	action	>ABCD	>trans	SprDem9
60 (&3C)	Output to sprite	>block	>sprite	>save					SprDem6,7,9
61 (&3D)	Output to mask	>block	>sprite	>save					SprDem7
62 (&3E)	Read save area size	>block	>sprite						SprDem6,7,9
	ON EXIT	-	-	size					

Notes: > means parameter is an address, pointing to required data. >ABCD means parameter points to a rectangle or transformation matrix, as used by ops 52 and 53 – see text for details / ? means parameter is a flag (0 or 1).

BIO LOGICALLY

Dave Acton finds more applications for his general-purpose program

Two months ago we introduced a helpful program for all seasons called *BIO*. It is designed to let you write desktop utilities easily, by taking care of the hard bit: multitasking.

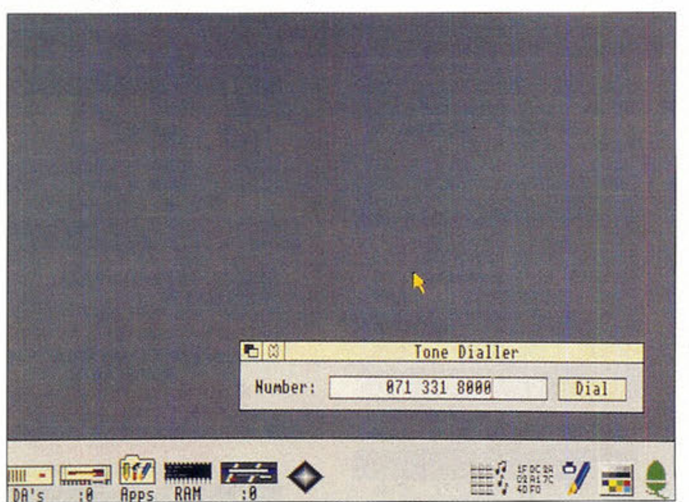
This month we have two modules to tack on to the main *BIO* application: *ToneDial* and *Hexdump*. You will need to have a copy of the controlling *BIO* application; this first appeared in February's yellow pages, but is also on this month's subscribers' disc.

TONEDIAL

ToneDial allows you to dial a a telephone number – without touching your telephone keys. *Tonedial* loads on to the icon bar. To use it, click on the icon then simply enter the number and press RETURN. The window disappears and those familiar dialling beeps are heard. If you hold your telephone up to the speaker, the number is dialled. Note that this application only works on modern digital networks.

Hexdump lets you check out your memory fast

Your Basic module needs to have a couple of extra functions to deal with the window. FNxxx_mouse is called whenever you click on an icon and takes five parameters: the mouse x, y and button states, the window handle and icon number. It should return TRUE if the icon pressed is to start the process. Similarly, FNxxx_key is called whenever there is an unusual keypress in an icon. This takes seven parameters: the window handle, icon number, caret x and y positions, caret height, the icon containing the caret and the key pressed (represented in Ascii). Again, TRUE is returned if the key is intended to start the process. Typically, RETURN in the last writeable icon should set things going.



BIO can simplify your telecommunications needs

Finally, your main routine FNxxx should check for a null input filename (file$=""). This means the process was started by a mouse click or keypress, not a file drag. In this case, the input data should be extracted from the appropriate icons. FNicon_text can be used here.

HEXDUMP

HexDump allows any file to be dragged on to the icon and the result is the hex dump of the file in *Edit* format.

This module is a good example of how a window may be used just to specify preferences. Icons are used to determine the type of output from the module. Several procedures and functions are built into the *BIO* application for this purpose:

- PROCset_button(w,i,state) selects or deselects icon i in window w depending on whether state is TRUE or FALSE.
- FNbutton_state(w,i) returns whether an icon is selected (TRUE or FALSE).
- FNicon_text(w,i) returns the current contents of a text icon.
- PROCwrite_in_icon(w,i,t$) sets the text in a text icon to t$. The icon *must* be indirected and there *must* be enough space for the new string.

To design a window template for your own *BIO* modules use Acorn's *FormEd* or Armen's *WindowEd*. This should contain one window definition with the module name as an identifier.

For more general details on *BIO* turn to *BAU* February 93.



Acorn The choice of experience

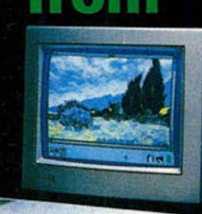
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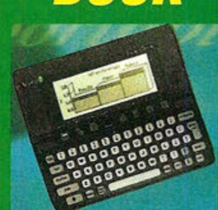
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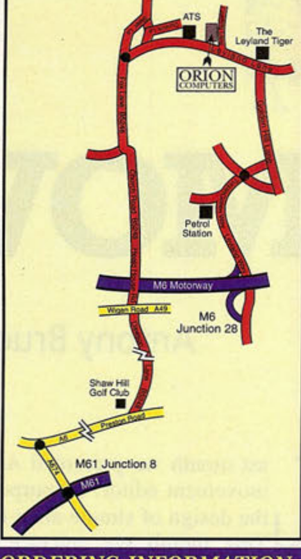
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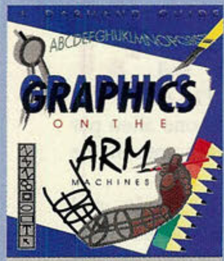
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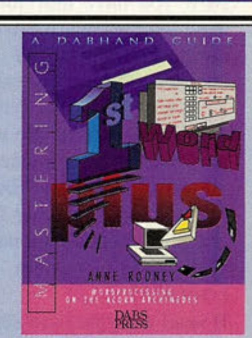
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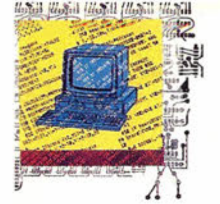
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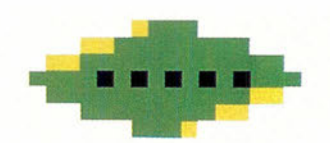


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MOVING TARGETS

Antony Bruce Lytis animates his aliens and puts everything together

Last month we presented *AlienEd*, the alien movement editor. Its purpose was to allow the design of simple alien movement paths. This month we enhance the editor and provide one last utility needed to aid the final game design.

ALIENED2

Each movement path designed with the original *AlienEd* was associated with a single sprite. This did not allow different sprites to use the same movement path; for example, different rocket designs, all of which take off and accelerate upwards, or aliens whose sprites are animated. Adding the extra lines of *AlienEd+* adds an extra box in which you can type a name for a movement path. This may be up to 12 characters in length (no spaces please).

As before, saved files appear in the Movement subdirectory and lines in a movement file take one of two possible formats:

- <sprite> <path>
- <name> <sprite> <path> [if path is named]

I recommend you name all movement paths.

PATTERN FILES

Now you have individual movement paths, you need to construct more complex definitions from them, called Pattern files. You must create another subdirectory called *Patterns* for these.

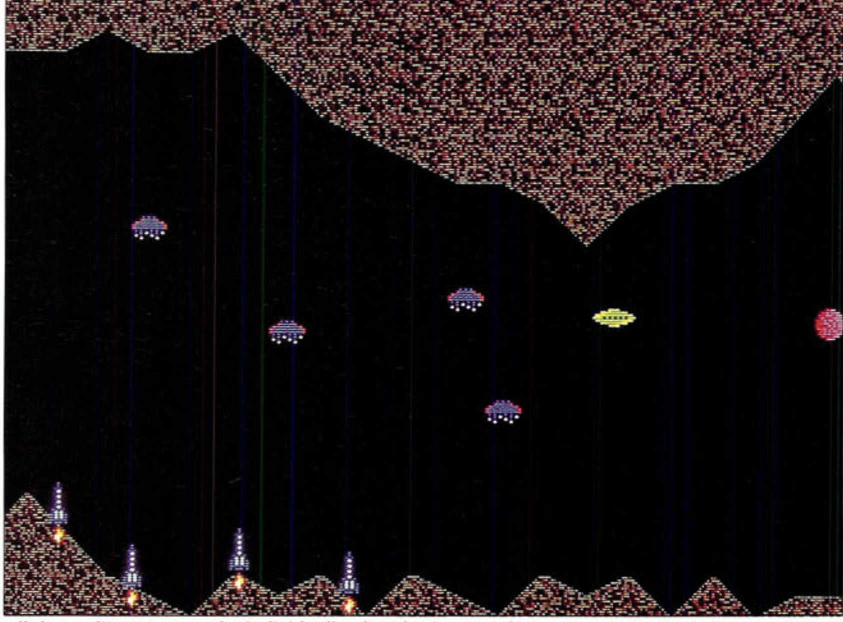
Pattern files are best created using *Edit* or similar. A Pattern file uses the paths named in a movement file to make up the pattern of movement for an enemy. Entries consist of a number of lines, all of similar form, except that the first one also contains the name of the enemy:

[<enemy>] <path to follow> [<time1>] [<time2>]

If time1 and time2 are zero, the enemy follows the path for ever. If time1 is present, this represents the number of steps along the path that it takes. The next line in the file then describes the next action to take. If both time1 and time2 are present, this represents a range. The number of steps actually taken will be chosen at random between the two values. The special path (LOOP) means start again. The box on the right shows some sample pattern definitions.

GAME FILES

We are now in a position to define our whole game in a Game files, which describes all the components of a game and should be created in *Edit*. The next page shows an example. All lines must be present and, as you can see, each names a component file of the game.



All these aliens can now be individually placed using Populate

> **SAMPLE PATTERNS**
>
> **Rocket1: RocketUp (always follow RocketUp)**
> **Rocket2: RocketUp 40 (follow RocketUp for 40 steps then die)**
> **Rocket3: RocketUp 20 60 (follow RocketUp for between 20 and 60 steps, die)**
> **Rocket4: RocketUp 30 RocketGo (follow RocketUp 30 steps, then follow RocketGo)**
> **Rocket5: RocketUp 25 RocketGo 50 (follow RocketUp for 25 steps, then RocketGo for 50, then die)**
> **Saucer: Saucer1 50 90 Saucer2 10 40 (LOOP) (follow Saucer1 for 50 to 90 steps, then Saucer2 for 10 to 40 steps, then repeat indefinitely)**

The Layout file contains details of where all the enemies are located along the landscape and at which points they become active. It is created by the editor, *Populate,* which you can find in the yellow pages. This edits the Layout file described in the Game file loaded at the start. If the given Layout file does not exist, an empty landscape is assumed.

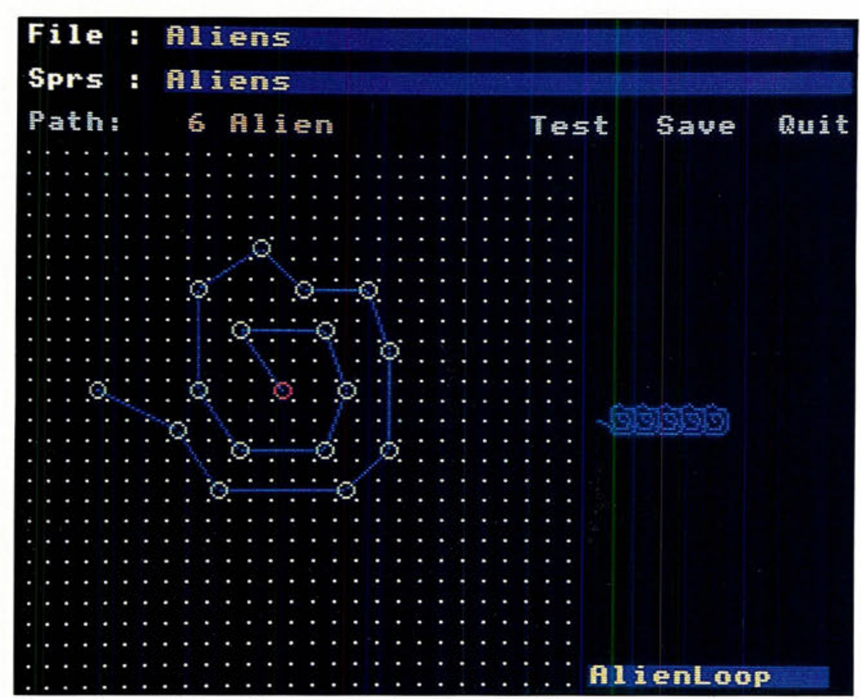
Most of the screen is used to show the landscape. Scroll it by moving the mouse to the left or right edges of the screen. The bottom area of the screen shows the current Layout file name and the current enemy name. For an enemy to exist, it must be present in the Movement file and its associated sprite must also be in the Sprite file. Click on the arrows to either side of the enemy to step through the baddy list.

If you click the middle button over the landscape, the pointer turns into the sprite of the current baddy. This can be positioned anywhere on-screen and fixed by pressing the left button. The only restriction is that there can only be one alien per pixel column. Moving to the bottom area of the screen cancels placement mode.

Holding down activates the ID mode, and shows the names of any enemies you point to. This can be used to distinguish different enemies using the same sprite. An enemy can be removed by SHIFT-left-clicking on it.

Clicking on an existing enemy with the left hand button will select it (and make it flash). It





The new improved alien editor lets you handle animated baddies

can then be repositioned by clicking on it with the middle mouse button and placing it in the usual way. While an enemy is selected, its 'go' status is shown in the bottom area of the screen. This is used to activate the enemy during its progress across the screen. Some enemies will never activate (shown by —). This is the default state for new enemies.

Click on the — with the left hand button to set one 'go point'. This makes the enemy activate when it reaches the position shown on the screen above. Now, if you scroll the screen when the enemy is to the right of this point, the 'go' status will change to << to show it will become active at some point. As soon as it passes its 'go' point, the status will show G1 to show it has passed its go point. The go point can be changed by clicking on the << or G1 again. To clear the go status and revert to always inactive, click with SHIFT held down.

As with pattern definitions, a range of 'go' points can be set. Once a go point has been set with the left button, a second can be set by clicking with the right button. The enemy will then activate at some randomly chosen time between these two points. The status will show either <<, meaning before the first 'go' point, ?? for between the two points and G2 after the second go point; the enemy will definitely be active by this later time.

To save the Layout file, click on the file name in the bottom right hand corner, altering it if necessary, and press RETURN or a mouse button. If the name has been changed, the Game file will be updated too.

The box above shows a simple layout file. x values will be between 0 and the length of the landscape in pixels and y values between 0 and 255. Go points are between 0 and 320. Using a single go point of 320 will mean the alien is active as soon as it is visible. As you can see, the layout is defined in two parts. First comes a section marked by the keyword 'patterns'. After this comes a list of the pattern names of the aliens placed in the landscape. Beside each is the unique pattern number. Then comes the 'layout' section which is simply a list of enemies; their pattern numbers, co-ordinates and go points.

A GAME FILE

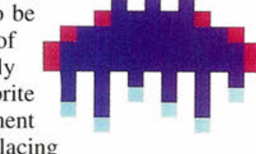
```
;>Games.Test
; Tue,02 Feb 1993.14:42:22
Scenery: Rocks
Maps:    Scape
Sprites: Aliens
Movement: Aliens
Patterns: Aliens
Layout:  Level1
```

A LAYOUT FILE

```
; >Layout.Level1
; Tue,09 Feb 1993.11:59:10
Patterns:
 Rocket1    0
 Saucer1    2
 Meteor     4
 Alien      5
Layout:
 0  330  28 308 120
 4  677  58 320
 4  689  97 320
 4  732 123 320
 2  923 122 266 142
 2 1038 117 246
 5 1185  76 204
 5 1239  34 188
```



A couple of months ago we covered the basics of sprite animation. We now need to think about how the sprites in our final game are to be animated and how the various stages of animation are to be stored. For the purposes of using *AlienEd,* you only need to specify a valid sprite name to try out a movement pattern. Similarly, when placing enemies using *Populate,* the sprite names associated with particular patterns are used to show the enemies' positions.



Rather than create another subdirectory, and another definition file type, animation for our final demo game is to be determined by simple sprite naming. Sprite names will be letters and valid symbols (like '_'). The digits '0' – '9' are reserved for specifying animation stages.

Consider a simple rocket. If only one image of the rocket is to be used a simple sprite called 'rocket' could be defined. To animate its engines might need, say, four images. In this case, simply copy the basic rocket design and alter the four images slightly to produce the animated sequence. The four sprites should be called 'rocket1' – 'rocket4'.

The presence of a single digit after the main sprite name indicates that the images should be used in sequence for a single frame each. Adding another digit speciies how long that image is used for. For example, if you want to use the four rocket images for three frames each, create sprites *rocket13*, *rocket23*, *rocket33* and *rocket43*.

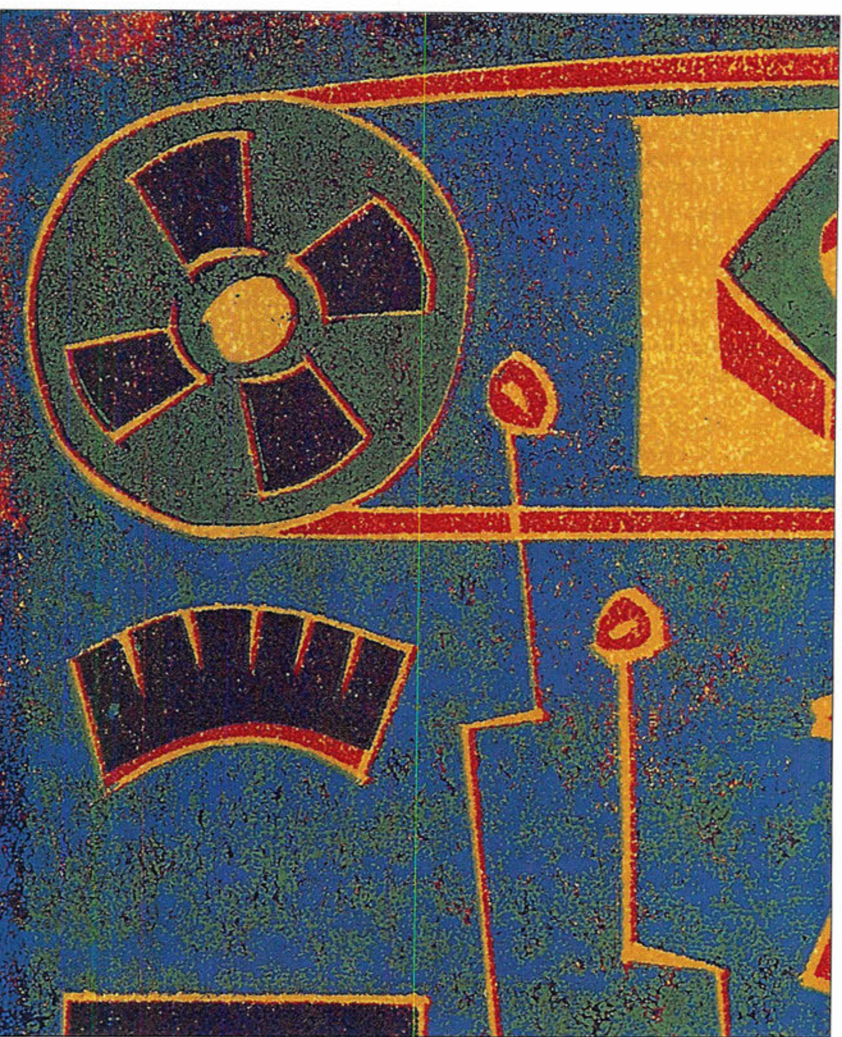
Combined with the movement paths, this provides a good deal of flexibility when it comes to animation. For the special case of rotatable sprites (see last month's article) use the suffix '0'. It is up to the final game code to decipher the sprite names and build the necessary tables for speedy animation.

ALL YOU NEED IS . . .

. . . a comprehensive list of files and directories needed for the final game, assuming all files are held in the parent directory *DemoGame*.

- DemoGame.Games holds the game files, created with *Edit*. Each game file contains a list of all the other files needed for a particular game; one from each of the other subdirectories.
- DemoGame.Layout holds the layout files, created with *Populate*.These contain the enemy positions and 'go' points.
- DemoGame.Maps holds the map files, created with EdLand. These describe the scenery for games; see our first article for details.
- DemoGame.Movement holds movement files, created with *AlienEd*. These describe movement paths, in turn combined to form patterns.
- DemoGame.Patterns holds the pattern files, created with *Edit*. These create named patterns which placed enemies follow.
- DemoGame.Scenery holds the scenery sprites, created with *Paint*.
- DemoGame.Sprites holds the enemy sprites, also created with *Paint*.





ASSEMBLY LINE

Dave Lawrence explains how to use recursion to get some very special effects

To start this month, just a few cautionary notes about writing recursive routines in Arm code. If you don't know what a recursive routine is, you have my full permission to skip this bit and join us again later on.

Recursion in Basic is relatively straightforward to use, as long as you can think straight about what you are trying to do. The listings *Basic1* and *Basic2* illustrate two simple uses of recursion. The first plots the commonly-sighted 'Persian carpet' pattern and the second sorts a list of numbers into order using the quicksort method.

Fairly obviously, if you were to translate either of these into Arm code, you'd have to be quite careful as to where and how you stacked your registers. Basic has 'implied' local variables so that even though a call to PROCsquare has been made with x-s, y-s, s/2, c-1, which get assigned to x, y, s and c, the 'original' x, y, s and c are left untouched and ready for the next call to PROCsquare. A similar process happens in the quicksort routine with the variables from and to. The Arm knows nothing about this sort of carry on, so you have to build it in when you write your routines.

As it happens, I have already converted both of these programs and the results can be seen in *Arm1* and *Arm2*. Looking at *Arm1* to start with, you should first notice that all the parameters x, y, s, c along with a currently mysterious register s2 and the link register are stacked; the last so we can either return to the previous level of recursion or escape back to Basic after the plot.

As we have no means of writing a PROCedure call complete with calculated parameters in Arm code, the four calls to PROCsquare are not straight-forward to convert. In each, s has always been halved, and c is always decremented by 1; only the new x and y differ in each one. As these parameters for this level of recursion are safely on the stack, we can actually do what we want with the copies still in the registers. We therefore halve s and decrement c immediately; you will note however that we take a copy of s into s2 before it is halved. The reason for this should become apparent.

We are now ready to recurse. The x and y of the first square are calculated by subtracting the original s – meaning s2 now – from the current x and y. Since s and c have been set up, we just need to BL square. We know that calling square preserves all the registers, so, on return from BL square we know x, y, s, c and s2 are the same as before the call.

To plot the next square, we just need to calculate a new x coordinate. We could retrieve the original x and y from the stack and ADD x,x,s2 and SUB y,y,s2 but there is an easier way – we can simply add 2×s2 to x. The final two squares proceed in a similar way.

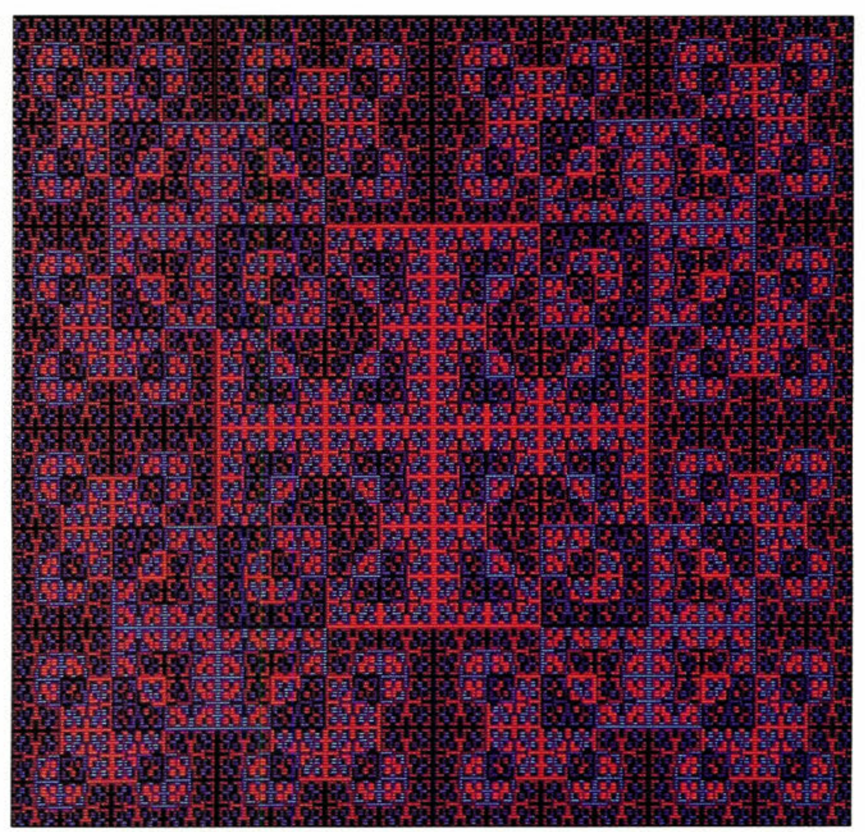
Before leaving the routine we need to actually plot the square. The original values of x, y, s and c are retrieved from the stack, but note that there is no '!', meaning write-back is not used so that the stack pointer remains unchanged. VDU 18 is used to set the GCOL and a pair of OS_Plot's are used to draw the rectangle.

All the examples to date in this series have been quick to run and we've never had cause to want to escape from one. This program, however, may take some time to run. If you have a multiscan monitor, you can change the CMP s,#4 to a CMP s,#2 to produce a finer pattern. If you then run this program on an machine fitted with anything less than an Arm3, you may be drumming your fingers. Detecting the ESCAPE key is not a problem. Using the 'magic' SWI call OS_ReadEscapeState is all you need to do. This returns with the carry flag set if an ESCAPE is pending. In a normal (meaning a non-recur-

sive) program you'd just jump to a suitable exit point or even simpler, you may use something like LDMCSFD (sp)!,{pc} to return to Basic.

Unfortunately, as the stack is being used constantly by the recursion, this would, at best, only return you one level back up the recursion and that's assuming that you're only stacking the return address. In *Arm1* this would load the PC with the last x position; not very useful. The simplest way out of this problem is to use the system used by *Arm1*.

When the code is first entered – at .dosquare – the link register is stacked and then, before the recursive part of the code is called, the current stack pointer is stored somewhere in memory. Then, no matter where in the recursion the plotting has reached, it can simply restore the stack pointer by loading it from that address and then pulling the original PC value off the original stack.



Recursion is used to lay down this elegant 'Persian carpet'; see how fast it runs in Arm code

QUICKSORT

The Arm implementation of the quicksort example is slightly different in the way it stacks its variables. If you take a look at the start of the main sort code (.quick_sort) it stacks only the return address; no other variables at all. The two search loops are then performed to roughly sort out the data.

The recursion happens in the last couple of blocks of code. As there is nothing else to do after these two calls, we can afford to be a little more blasé with our stacking. We know that quick_sort does not preserve any of the registers, so we must stack the ones we will need for the second recursive call to quick_sort. A quick glance at the Basic listing shows that we will need b, from and to.

So, those are the ones we stack before the first call. On return from this call they are pulled back off ready for the second call. In this case, we are actually saving quite a bit of time by doing it this way. If we stacked these registers each time quick_sort was called we'd double the amount of stacking commands.

Recursion is a frightfully cunning programming technique. It maybe a little daunting at first, but a steady head and a cool hand are all that's needed. When programming in Arm, it's quite easy to go into mind-warp when trying to recurse successfully, so let's be careful out there!

BLIMEY, THAT'S GOOD

As promised last time, I'll finish off this month with an exceedingly handy little routine I knocked up over the weekend. The program *Debug* is designed to be part of a library and can be installed by adding the line LIBRARY "%.Debug" near the start of your program. It needs a small amount of code space to assemble into, so make sure you DIM enough and include the line PROCassemble_debug somewhere inside your assembly loop. I normally put it just before the NEXT.

I always use the variable pass for my two passes, and therefore *Debug* has a couple of OPT pass instructions. If you use some other control variable, then these should be changed. Once this has been done, *Debug* provides you with FNdebug(string$). At its simplest, this can be used for printing strings, and is therefore eqivalent to the OS_WriteS SWI call. However, with the cunning use of the '\' character, it comes into a world of its own, the sequence \n\ is translated into carriage return + linefeed (meaning Ascii 10 and 13). Any other string between a pair of '\'s is treated as a register number and its value is printed.

Registers can be specified by their number, for example \2\ for R2 or any EVAL-able string (usually its name). This therefore allows you to use \read\ (assuming read has been aliased). Register values will be printed in decimal by default. Prefixing the number – or name – with a '&' will print the value in hex, and a '%' will print the eight-bit binary value of the lowest byte of the register. There is space available for a further five dump formats as things stand, but these three are really the only ones I've ever needed to use.

USING DEBUG

To include some debug text in your program just make a call to FNdebug. This assembles a branch with link to the actual debug code and stores a coded version of the debug string immediately following the branch. An ALIGN instruction is included to ensure the rest of the code is assembled correctly.

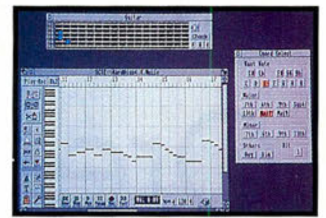
The debug code itself preserves all registers – so you can put debug code wherever you want – and returns properly the instruction after the ALIGN. Try adding *Debug* to *Arm2* and inserting the line . . .

```
FNdebug("\from\ -> \to\\n\")
```

. . . after the STMFD following .quick_sort; you'll see it display the ranges of elements that it's sorting. As usual, all of the programs in this article can be found on the yellow pages.



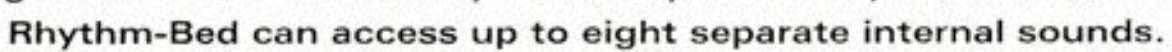
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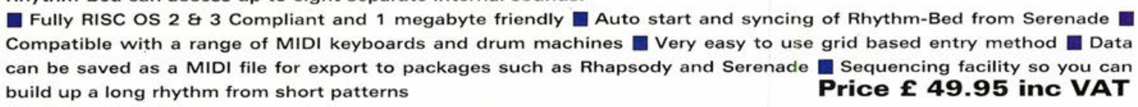
Serenade is a desktop MIDI sequencer for the full range of Acorn RISC OS machines. A great deal of effort has gone into creating a graphical user interface that gives access to the power of Serenade without making it complex to use.

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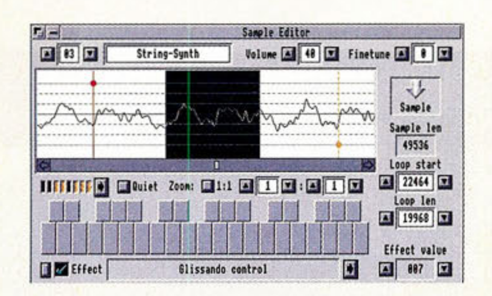
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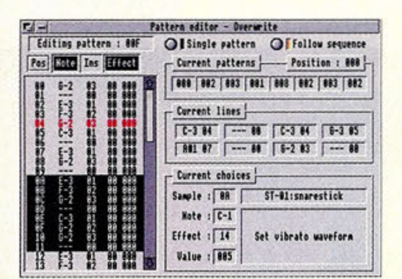
Advanced Features

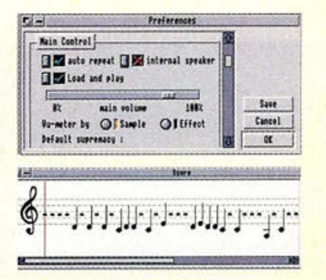


Built in Sample editor, allows you to Cut and Paste parts of the sample. You can try out any of the 40 different special effects, and define a repeat loop by dragging visual markers.

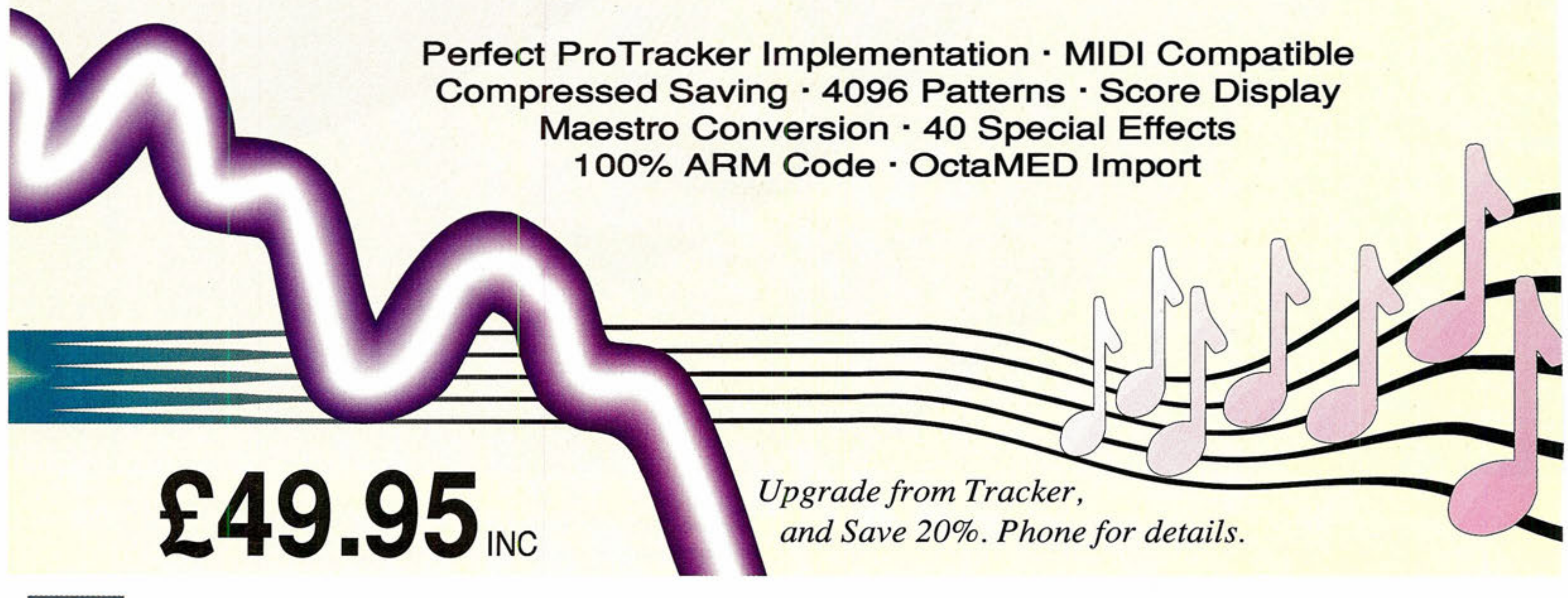


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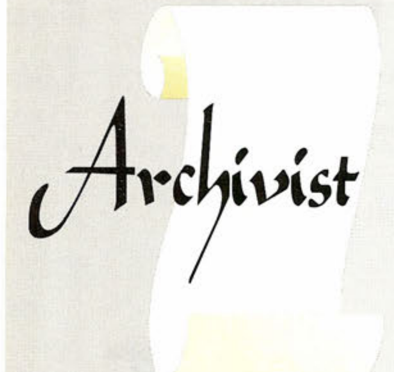
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Text, Integer, & Real field types can be set,in addition to multiple format Date fields, and Formula fields with user definable equations.

Alterations, for example - extra fields can be added to a card, even if you have started inputting data, and no data will be lost.

Archivist is able to store and display or play Textfiles, Sprites, Drawfiles, Maestros, Samples and Soundtracks.

Archivist can be interrogated using either of two search routines, Easy Search gives you a duplicate copy of the card, you type the variable to be searched for in the appropriate field, and Archivist does the rest.

For those requiring a little more flexibility, a complex search equation can be built up using mathematical, and Basic Operands.

Of course, Archivist also provides a Search and Replace facility, plus a fast Primary & Secondary Sort routine

A Clipboard, allowing cut and paste operations, and a user definable Quick Entry routine, speeds up data entry into Archivist considerably.

Card Print allows printing of cards in WYSIWYG format, using of course the standard Outline fonts. (2 supplied)

Reports generator, allows your data to be presented in a tabular form. Archivist also has a specifically designed Label Printer for your Names and Addresses files.

Archivist files are saved compressed to save valuable disc space, and with a Password for privacy if required.

Archivist can automatically produce CSV files, with the option to create Graphbox headers. Also it is possible to save data as a textfile for export to DTP's etc.

Statistics window displays the Averages, Minimums, Maximums and Totals of each field for the entire database.

Archivist is able to Import files from many existing databases, on the Archimedes, as well as the BBC and PC.

Existing Version 2 users can upgrade to Version 4.70 for just £5, when returning the original disc.

Powerful Databas

YELLOW PAGES

Free programs for you to type in and use

HOW TO ENTER THE PROGRAMS

This section describes how to enter and use the more complicated programs in the yellow pages. A lot of the explanations mention the CSD: for more details on the Currently Selected Directory, see the box below.

***INFO (page 69)**

Info3 - Info5

Type in *RMSaveS* and save it. Double-click on *RMSaveS* to save a utility program called *RMSave* in the CSD, so set the CSD to the directory where you wish to save *RMSave*. This utility can then be used as described in *INFO.

PatchPin should be saved into the same directory as the Pinboard module. Set this directory as the CSD and double-click on *PatchPin*. This will save a module called *NewPin* in the CSD. Double-click on *NewPin* to load the patched Pinboard.

SaveSprs saves the Rom sprites in the CSD. It is only really required for Risc OS 2, as the file it saves is the same as *Resources:$.Resources.Wimp.Sprites* in Risc OS 3.

Info11 & Info12

Create a directory called *!Auto*, and save both listings inside this (double-click on *!Auto* while holding down SHIFT to open the directory). Set the CSD to !Auto, and double-click on AutoDat. This will create four files inside *!Auto* (*!Boot*, *!Run*, *!RunImage* and *!Sprites*). The *Auto* application is now complete.

Info13 & Info14

Save both *Monkey1* and *Monkey2* on the same disc, and CHAIN"Monkey1" to start. *Monkey1* will run *Monkey2* automatically.

BIO LOGICALLY (page 79)

Bio1 - Bio4

These four programs need to be saved inside the *Bio* application, as listed in February '93. To open up the Bio library directory, double-click on *!Bio* while holding down SHIFT, and then double-click on *Library*. Now create two directories, one called *HexDump*, and one called *ToneDial*.

Save the programs *HexDump* and *Hex_Dat* inside *HexDump*, and save *ToneDial* and *Tone_Dat* inside *ToneDial*. Next, open up *HexDump* and set it as the CSD. Then double-click on *Hex_Dat* to create the files *Sprites* and *Templates*, and finally delete *Hex_Dat*. Repeat the process for *ToneDial* (i.e. set the CSD to *ToneDial* and run and delete *Tone_Dat*). Now the *Bio* application will run the two new modules automatically.

Setting the Currently Selected Directory (CSD)

Some of the explanations above require the CSD to be set to a certain directory for them to work. To do this, you must first create an Obey file (using Edit), containing just the following line:

```
Dir <Obey$Dir>
```

Next save it under the name *ThisDir* in the directory you wish to set as the CSD. Finally, double-click on *ThisDir* to set the CSD to that directory.

COMPATIBILITY CHART

Use this chart to check if a program will work on your machine. There are two columns, one for eight-bit machines like the Model B and Master 128, and one for 32-bit machines, like the A3000, A400 or A3010. If there is a star for the program in the column then it will work on your machine. Special exceptions and hardware requirements are listed as foot notes at the end of the table.

Article	Program Name	8-bit	32-bit
***INFO (page 69)**			
Info1	*Lorenzo*		*
Info2	*Ribbon*		*
Info3	*RMSaveS*		*
Info4	*PatchPin*		*
Info5	*SaveSprs*		*
Info6	3DGraph/1		*
Info7	*Newton/1*		*
Info8	*Dots*		*
Info9	*IntSort*		*
Info10	*FracSort*		*
Info11	*!RunImage*		*
Info12	*AutoDat*		*
Info13	*Monkey1*	*	
Info14	*Monkey2*	*	
Info15	*Why?*		*
Info16	*SprDemo6*		*
Info17	*SprDemo7*		*
Info18	*SprDemo8*		*
Info19	*SprDemo9*		*
BIO LOGICAL (page 79)			
Bio1	*HexDump*		*
Bio2	*Hex_Dat*		*
Bio3	*ToneDial*		*
Bio4	*Tone_Dat*		*
MOVING TARGETS (page 82)			
GameDes1	*AlienEd2*		*
GameDes2	*Populate*		*
ASSEMBLY LINE (page 85)			
Arm1	*Basic1*		*
Arm2	*Basic2*		*
Arm3	*Arm1*		*
Arm4	*Arm2*		*
Arm5	*Debug*		*

Listing Info1

```
   1Ø REM     >Lorenzo (Info1)
   2Ø REM By  Jan Vlietinck
   3Ø REM For 32-bit machines
   4Ø REM (c) BAU April 1993
   5Ø :
   6Ø MODE 13
   7Ø OFF
   8Ø PROCass
   9Ø PROCmain
  1ØØ END
  11Ø :
  12Ø DEF PROCmain
  13Ø m=2^22
  14Ø REPEAT
  15Ø  x=(1Ø+RND(2ØØ)-5Ø)*m
  16Ø  y=(1Ø+RND(5Ø))*m
  17Ø  z=(1ØØ+RND(1ØØ))*m
  18Ø  FOR i=Ø TO 3ØØ
  19Ø   table!(12*i)=-x
  2ØØ   table!(12*i+4)=y
  21Ø   table!(12*i+8)=z
  22Ø  NEXT
  23Ø  table!(12*i)=1<<31
  24Ø  table!(12*i+4)=1<<31
  25Ø  table!(12*i+8)=1<<31
  26Ø  CLS
  27Ø  CALL begin
  28Ø UNTIL FALSE
  29Ø ENDPROC
  3ØØ :
  31Ø DEF PROCcoltable(ctable)
  32Ø swp=2
  33Ø c=Ø
  34Ø m=15
  35Ø FOR k=Ø TO m
  36Ø  PROCput(c+(k AND %11ØØ)*5.25,k AN
D %11)
  37Ø NEXT
  38Ø FOR t=1 TO 3
  39Ø  c=t
  4ØØ  m=4*(4-t)-1
  41Ø  PROCside(4)
  42Ø  PROCside(-1)
  43Ø  PROCside(16)
  44Ø  PROCside(-4)
  45Ø  PROCside(1)
  46Ø  PROCside(-16)
  47Ø NEXT
  48Ø ENDPROC
  49Ø :
  5ØØ DEF PROCside(rgb)
  51Ø FOR i=1 TO t
  52Ø  c+=rgb
  53Ø  IF swp=1 THEN
  54Ø   FOR k=Ø TO m
  55Ø    PROCput(c+(k AND %11ØØ)*5.25,k
AND %11)
  56Ø   NEXT
  57Ø  ELSE
  58Ø   FOR k=m TO Ø STEP -1
  59Ø    PROCput(c+(k AND %11ØØ)*5.25,k
AND %11)
  6ØØ   NEXT
  61Ø  ENDIF
  62Ø  swp=swp EOR 3
  63Ø NEXT
  64Ø ENDPROC
  65Ø :
  66Ø DEF PROCput(c,t)
  67Ø b1=(c>>5) AND 1
  68Ø b2=(c>>4) AND 1
  69Ø g1=(c>>3) AND 1
  7ØØ g2=(c>>2) AND 1
  71Ø r1=(c>>1) AND 1
  72Ø r2=(c>>Ø) AND 1
  73Ø col=t+4*(r2+2*(b2+2*(r1+2*(g2+2*(g
1+2*b1)))))
  74Ø ?ctable=col
  75Ø ctable+=1
  76Ø ENDPROC
  77Ø :
  78Ø DEF PROCass
  79Ø DIM ctable 256
  8ØØ PROCcoltable(ctable)
  81Ø DIM Q% 1ØØØ
  82Ø DIM table 13*1ØØØ
  83Ø x=Ø:y=1:z=2:a=3:b=4:c=5
  84Ø t=6:sc=7:tel=8
  85Ø u=9:v=1Ø:w=11
  86Ø tab=12:col=14
  87Ø FOR p=Ø TO 2 STEP 2
  88Ø P%=Q%
  89Ø [OPT p
  9ØØ .scrd   EQUD    148
  91Ø         EQUD    -1
  92Ø .screen EQUD    Ø
  93Ø .tabd   EQUD    table
  94Ø .teld   EQUD    1Ø5<<6
  95Ø .ct     EQUD    ctable
  96Ø
  97Ø .begin  STMFD   r13!,{r14 }
  98Ø         ADR     rØ,scrd
  99Ø         ADR     r1,screen
 1ØØØ         SWI     "OS_ReadVduVariabl
es"
 1Ø1Ø         LDR     sc,screen
 1Ø2Ø         ADD     sc,sc,#4Ø*128
 1Ø3Ø         ADD     sc,sc,#16Ø
 1Ø4Ø         LDR     tel,teld
 1Ø5Ø         ADD     tel,tel,#1
 1Ø6Ø         STR     tel,teld
 1Ø7Ø .loop1  LDR     tab,tabd
 1Ø8Ø         LDR     col,ct
 1Ø9Ø         MOV     t,tel,ASR #6
 11ØØ         AND     t,t,#255
 111Ø         LDRB    col,[col,t]
 112Ø .loop2  LDMIA   tab,{x ,y,z}
 113Ø         CMP     x,#1<<31
 114Ø         BEQ     skip
 115Ø         MOV     u,x,ASR #16
 116Ø         MOV     v,y,ASR #16
 117Ø         MOV     w,z,ASR #16
 118Ø         SUB     a,v,u
 119Ø         ADD     a,a,a,LSL #2
 12ØØ         RSB     b,w,#28<<9
 121Ø         MUL     b,u,b
 122Ø         RSB     b,v,b,ASR #9
 123Ø         MUL     c,u,v
 124Ø         MOV     c,c,ASR #9
 125Ø         SUB     c,c,w,LSL #1
 126Ø         ADD     x,x,a,ASL #8
 127Ø         ADD     y,y,b,ASL #7
 128Ø         ADD     z,z,c,ASL #7
 129Ø         ADD     t,u,v
 13ØØ         MOV     a,t,ASR #7
 131Ø         ADD     t,w,v,ASR #1
 132Ø         MOV     b,t,ASR #7
 133Ø         ADD     t,b,b,LSL #2
 134Ø         ADD     t,a,t,LSL #6
 135Ø         ADD     t,t,sc
 136Ø         STRB    col,[t]
 137Ø         STRB    col,[t,#1]
 138Ø         STRB    col,[t,#-1]
 139Ø         STRB    col,[t,#32Ø]
 14ØØ         STRB    col,[t,#-32Ø]
 141Ø         LDR     t,tabd
 142Ø         CMP     t,tab
 143Ø         BEQ     ski
 144Ø         SUB     tab,tab,#12
 145Ø         LDMIA   (tab)!,{a ,b,c}
 146Ø         SUB     t,a,x
 147Ø         ADD     x,x,t,ASR #4
 148Ø         SUB     t,b,y
 149Ø         ADD     y,y,t,ASR #4
 15ØØ         SUB     t,c,z
 151Ø         ADD     t,t,#4ØØ<<7
 152Ø         ADD     z,z,t,ASR #4
 153Ø .ski    STMIA   (tab)!,{x ,y,z}
 154Ø         B       loop2
 155Ø .skip   ADD     tel,tel,#1
 156Ø         SWI     "OS_ReadEscapeStat
e"
 157Ø         LDMCSFD r13!,{pc }
 158Ø         SWI     "OS_Mouse"
 159Ø         CMP     r2,#Ø
 16ØØ         BEQ     loop1
 161Ø .wait   SWI     "OS_Mouse"
 162Ø         CMP     r2,#Ø
 163Ø         BNE     wait
 164Ø         LDMFD   r13!,{pc }
 165Ø ]
 166Ø NEXT
 167Ø ENDPROC
```

Listing Info2

```
   1Ø REM     >Ribbon (Info2)
   2Ø REM By  Jan Vlietinck
   3Ø REM For 32-bit machines
   4Ø REM (c) BAU April 1993
   5Ø :
   6Ø MODE 13
   7Ø OFF
   8Ø PROCass
   9Ø MOUSE ON
  1ØØ REPEAT
  11Ø  A%=(16Ø-1ØØ+RND(2ØØ))<<4
  12Ø  B%=(128-1ØØ+RND(2ØØ))<<4
  13Ø  B%=(128-1ØØ+RND(2ØØ))<<4:REM14Ø<<
4
  14Ø  C%=RND(1)*256*1Ø-512
  15Ø  D%=Ø
  16Ø  CALL set
  17Ø  CALL begin
  18Ø  WAIT
  19Ø  CLS
  2ØØ UNTIL FALSE
  21Ø END
  22Ø :
  23Ø DEF PROCass
  24Ø DIM table 4*4Ø96
  25Ø m=256*256
  26Ø !table=1Ø
  27Ø FOR i=1 TO 4Ø96
  28Ø  table!(4*i)=m/(i+1Ø)
  29Ø NEXT
  3ØØ x1=7Ø<<4
  31Ø y1=8Ø<<4
  32Ø x2=25Ø<<4
  33Ø y2=8Ø<<4
  34Ø x3=16Ø<<4
  35Ø y3=19Ø<<4
  36Ø x=Ø:y=1:vx=2:vy=3
  37Ø a=4:b=5:t=6:tab=7
  38Ø scr=8:col=9:cnt=1Ø
  39Ø DIM Q% 1ØØØ
  4ØØ FOR pass=Ø TO 2 STEP 2
  41Ø P%=Q%
  42Ø [OPT pass
  43Ø .tabd   EQUD    table
  44Ø .scrd   EQUD    148
  45Ø         EQUD    -1
  46Ø .screen EQUD     Ø
  47Ø
  48Ø .set    ADR     rØ,scrd
  49Ø         ADR     r1,screen
  5ØØ         SWI     "OS_ReadVduVariabl
es"
  51Ø         MOV     pc,R14
  52Ø
  53Ø .kol    EQUD    1ØØ<<11
  54Ø .begin
  55Ø         LDR     tab,tabd
  56Ø         LDR     scr,screen
  57Ø         ADD     scr,scr,#64Ø
  58Ø         MOV     col,#255
  59Ø         LDR     cnt,kol
  6ØØ .loop   RSB     a,x,#x1
  61Ø         RSB     b,y,#y1
  62Ø         MUL     t,a,a
  63Ø         MLA     t,b,b,t
  64Ø         MOV     t,t,LSR #14
  65Ø         LDR     t,[tab,t,LSL #2]
  66Ø         MUL     a,t,a
  67Ø         MOV     a,a,ASR #14
  68Ø         MUL     b,t,b
  69Ø         MOV     b,b,ASR #14
  7ØØ         ADD     vx,vx,a
  71Ø         ADD     vy,vy,b
  72Ø         RSB     a,x,#x2
  73Ø         RSB     b,y,#y2
  74Ø         MUL     t,a,a
  75Ø         MLA     t,b,b,t
  76Ø         MOV     t,t,LSR #14
  77Ø         LDR     t,[tab,t,LSL #2]
  78Ø         MUL     a,t,a
  79Ø         MOV     a,a,ASR #14
  8ØØ         MUL     b,t,b
  81Ø         MOV     b,b,ASR #14
  82Ø         ADD     vx,vx,a
  83Ø         ADD     vy,vy,b
  84Ø         RSB     a,x,#x3
  85Ø         RSB     b,y,#y3
  86Ø         MUL     t,a,a
  87Ø         MLA     t,b,b,t
  88Ø         MOV     t,t,LSR #14
  89Ø         LDR     t,[tab,t,LSL #2]
  9ØØ         MUL     a,t,a
  91Ø         MOV     a,a,ASR #14
  92Ø         MUL     b,t,b
  93Ø         MOV     b,b,ASR #14
  94Ø         ADD     vx,vx,a
  95Ø         ADD     vy,vy,b
  96Ø         ADD     x,x,vx,ASR #1Ø
  97Ø         ADD     y,y,vy,ASR #1Ø
  98Ø         MOV     a,x,ASR #4
  99Ø         MOV     b,y,ASR #4
 1ØØØ         ADD     t,b,b,LSL #2
 1Ø1Ø         ADD     t,a,t,LSL #6
 1Ø2Ø         CMP     t,#32Ø*256
 1Ø3Ø         ADD     t,t,scr
 1Ø4Ø         STRLOB  col,[t]
 1Ø5Ø         STRLOB  col,[t,#1]
 1Ø6Ø         STRLOB  col,[t,#2]
 1Ø7Ø         STRLOB  col,[t,#3]
 1Ø8Ø         STRLOB  col,[t,#4]
 1Ø9Ø         STRLOB  col,[t,#5]
 11ØØ         STRLOB  col,[t,#6]
 111Ø         STRLOB  col,[t,#-1]
 112Ø         STRLOB  col,[t,#-2]
 113Ø         STRLOB  col,[t,#-3]
 114Ø         STRLOB  col,[t,#-4]
 115Ø         STRLOB  col,[t,#-5]
 116Ø         STRLOB  col,[t,#-6]
 117Ø         MOV     col,#Ø
 118Ø         STRLOB  col,[t,#-7]
 119Ø         STRLOB  col,[t,#7]
 12ØØ         ADD     cnt,cnt,#1
 121Ø         MOV     col,cnt,LSR #11
 122Ø         ORR     col,col,#16
 123Ø         STMFD   13!,{Ø-3 }
 124Ø         SWI     "OS_ReadEscapeStat
e"
 125Ø         LDMCSFD r13!,{pc }
 126Ø         SWI     "OS_Mouse"
 127Ø         CMP     r2,#Ø
 128Ø         LDMFD   13!,{Ø-3 }
 129Ø         BEQ     loop
 13ØØ .wait   SWI     "OS_Mouse"
 131Ø         CMP     r2,#Ø
 132Ø         BNE     wait
 133Ø         STR     cnt,kol
 134Ø         MOV     pc,R14
 135Ø ]
 136Ø NEXT
 137Ø ENDPROC
```

Listing Info3

```
   1Ø REM     >RMSaveS (Info3)
   2Ø REM By  DL & DA
   3Ø REM For 32-bit machines
   4Ø REM (c) BAU April 1993
   5Ø :
   6Ø DIM code 4ØØ
   7Ø sp=13:link=14:pc=15
   8Ø FOR pass=Ø TO 2 STEP 2:P%=code
   9Ø [OPT pass
  1ØØ          STMFD   (sp)!,{rØ-r7 ,link}
  11Ø
  12Ø          MOV     R6,R1
  13Ø
  14Ø          LDRB    RØ,[R6]
  15Ø          CMP     RØ,#32
  16Ø          ADRLT   RØ,syntax
  17Ø          BLT     exit_error
  18Ø
  19Ø .skipword
  2ØØ          LDRB    RØ,[R6]
  21Ø          CMP     RØ,#32
  22Ø          ADDGT   R6,R6,#1
  23Ø          BGT     skipword
  24Ø          MOVLT   R6,R1
  25Ø
  26Ø .skipspaces
  27Ø          LDRB    RØ,[R6]
  28Ø          CMP     RØ,#32
  29Ø          ADDEQ   R6,R6,#1
  3ØØ          BEQ     skipspaces
  31Ø          MOVLT   R6,R1
  32Ø
  33Ø          MOV     RØ,#18
  34Ø          SWI     "XOS_Module"
  35Ø          BVS     exit_error
  36Ø
  37Ø          MOV     RØ,#1Ø
  38Ø          MOV     R1,R6
  39Ø          LDR     R2,type
  4ØØ          LDR     R5,[R3,#-4]
  41Ø          MOV     R4,R3
  42Ø          ADD     R5,R4,R5
  43Ø          MOV     R3,#Ø
  44Ø          SWI     "XOS_File"
  45Ø          BVS     exit_error
  46Ø
  47Ø .exit_save
  48Ø          LDMFD   (sp)!,{rØ-r7 ,pc}
  49Ø
  5ØØ .exit_error
  51Ø          STR     RØ,[sp]
  52Ø          LDMFD   (sp)!,{rØ-r7 ,link}
  53Ø          ORRS    pc,link,#1<<28
  54Ø
  55Ø .type    EQUD &FFA
  56Ø .syntax
  57Ø          EQUD 22Ø
  58Ø          EQUS "Syntax: *RMSave <mod
ule> [<filename>]"
  59Ø          EQUB 13
  6ØØ          EQUB Ø
  61Ø ]NEXT
  62Ø SYS "OS_File",1Ø,"%.RMSave",&FFC,,
code,P%
```

Listing Info4

```
   1Ø REM     >PatchPin (Info4)
   2Ø REM By  DL & DA
   3Ø REM For 32-bit machines
   4Ø REM (c) BAU April 1993
   5Ø :
   6Ø DIM block 2ØØØØ
   7Ø SYS "OS_File",&FF,"Pinboard",block
 TO ,,,,len
   8Ø :
   9Ø valid$=FNzero(block+&9D4)
  1ØØ help$=$(block+block!&2AC)
  11Ø syntax$=FNzero(block+block!&2A8)
  12Ø synend$=""
  13Ø WHILE RIGHT$(syntax$,1)<>" "
  14Ø  synend$=RIGHT$(syntax$,1)+synend$
  15Ø  syntax$=LEFT$(syntax$)
  16Ø ENDWHILE
  17Ø :
  18Ø FOR pass=Ø TO 2 STEP 2
  19Ø P%=block+len
  2ØØ [OPT pass
  21Ø .newbackdrop
  22Ø STMFD   R13!,{r14 }
  23Ø MOV     R1,RØ
  24Ø ADR     RØ,valid
  25Ø ADD     R2,R12,#&45Ø
  26Ø MOV     R3,#&1ØØ
  27Ø SWI     "XOS_ReadArgs"
  28Ø LDMVSFD R13!,{pc }
  29Ø LDR     RØ,[R2,#2Ø]
  3ØØ CMP     RØ,#Ø
  31Ø LDRNEB  RØ,[RØ,#1]
  32Ø ANDNE   RØ,RØ,#15
  33Ø ORRNE   RØ,RØ,#&8Ø
  34Ø STRNEB  RØ,bcol
  35Ø LDMFD   R13!,{pc }
  36Ø
  37Ø .bcol
  38Ø EQUD    &84
  39Ø
  4ØØ .getcolour
  41Ø LDRB    RØ,bcol
  42Ø MOV     PC,R14
  43Ø
  44Ø .valid
  45Ø EQUS    valid$+",B=Background/e"
  46Ø EQUB    Ø
  47Ø ALIGN
  48Ø
  49Ø .newhelp
  5ØØ EQUS    LEFT$(help$)
  51Ø EQUS    " and allows the desktop c
olour to be changed."
  52Ø EQUB    13
  53Ø .newsyntax
  54Ø EQUS    syntax$+"[-Background <col
our>] "
  55Ø EQUS    synend$
  56Ø EQUB    Ø
  57Ø ALIGN
  58Ø
  59Ø ]NEXT
  6ØØ end=P%
  61Ø :
  62Ø REM Patch original *Backdrop comma
nd
  63Ø REM to point to new decode routine
  64Ø REM that deals with -Background
  65Ø REM
  66Ø P%=block+&8AØ
  67Ø [OPT 2
  68Ø  MOV RØ,RØ
  69Ø  MOV RØ,RØ
  7ØØ  MOV RØ,RØ
  71Ø  MOV RØ,RØ
  72Ø  BL  newbackdrop
  73Ø ]
  74Ø :
  75Ø REM Patch the two Wimp_SetColour c
alls
  76Ø REM to use the colour given
  77Ø REM
  78Ø P%=block+&E1Ø
  79Ø [OPT 2
  8ØØ  BLNE getcolour
  81Ø ]
  82Ø P%=block+&24E8
  83Ø [OPT 2
```

```
  840  BL getcolour
  850 ]
  860 :
  870 REM Patch *command table to allow
up
  880 REM to four parameters to *Backdro
p
  890 REM and point to new help and synt
ax
  900 REM
  910 block!&2A4=&040100
  920 block!&2A8=newsyntax-block
  930 block!&2AC=newhelp-block
  940 :
  950 SYS "OS_File",10,"NewPin",&FFA,,bl
ock,end
  960 END
  970 :
  980 DEF FNzero(z)
  990 z$=""
 1000 WHILE ?z<>0
 1010  z$+=CHR$?z
 1020  z+=1
 1030 ENDWHILE
 1040 =z$
```

Listing Info5

```
   10 REM     >SaveSprs (Info5)
   20 REM By  DL & DA
   30 REM For 32-bit machines
   40 REM (c) BAU April 1993
   50 :
   60 SYS "Wimp_BaseOfSprites" TO rom,ra
m
   70 SYS "OS_SpriteOp",&10C,rom,"ROMspr
s"
```

Listing Info6

```
   10 REM     >3DGraph/1 (Info6)
   20 REM By  Alistair Brown
   30 REM For 32-bit machines
   40 REM (c) BAU April 1993
   50 :
   60 MODE0:OFF:VDU19,0,7;0;19,1,0;0;:s=
25:FORc=-15TO15STEP.25:f=-500:g=500:FORz
=16TO-16STEP-.25:e=40/(40-z):a=SQR(c^2+z
^2)+1E-10:y=6*SINa/a-12:y=y*e:f=-y*(y>=f
)-f*(y<f):g=-y*(y<=g)-g*(y>g):p=-(y=f OR
y=g):PLOT69,(c*e*s+640)*p,(y*s+712)*p:NE
XT:NEXT
```

Listing Info7

```
   10 REM     >Newton/1 (Info7)
   20 REM By  Alistair Brown
   30 REM For 32-bit machines
   40 REM (c) BAU April 1993
   50 :
   60 MODE1:VDU23;8202;0;0;0;0:FORx=-1TO
1STEP1/128:FORy=-1TO1STEP1/128:a=x:b=y+.
001:REPEATc=a^3-3*a*b^2-1:d=3*b*a^2-b^3:
e=(a^2+b^2)^2:f=2*a*b/e:a=(2*a+(a^2-b^2)
/e)/3:b=(2*b-f)/3:UNTIL(c^2+d^2)<1E-5:GC
OL0,-((a>0)+(a<0ANDb>0)*2+(a<0ANDb<0)*3)
:PLOT69,x*512+512,y*512+512:NEXT:NEXT
```

Listing Info8

```
   10 REM     >Dots (Info8)
   20 REM By  Tim Jones
   30 REM For 32-bit machines
   40 REM (c) BAU April 1993
   50 :
   60 dim=&9900
   70 steps=10
   80 shapes=9
   90 ON ERROR SYS "Hourglass_Smash":REP
ORT:PRINT;" at ";ERL:END
  100 DIM code dim
  110 more=0
  120 FOR pass=0 TO 2 STEP 2
  130 P%=code
  140 [OPT pass
  150 .dotty
  160          STMFD   r13!,{r14 }
  170          SWI     "OS_RemoveCursors"
  180          MOV     r10,#1<<9
  190          MOV     r9,#1<<23
  200          MOV     r12,#0
  210          MOV     r11,#0
  220          MOV     r8,#0
  230 .dottylp
  240          SWI     "XOS_ReadEscapeSta
te"
  250          BCC     no_esc
  260          MOV     r0,#126
  270          SWI     "XOS_Byte"
  280          LDMFD   r13!,{pc }
  290 .no_esc
  300          MOV     r0,#122
  310          SWI     "OS_Byte"
  320          TEQ     r1,#62
  330          MOVEQ   r10,#1<<9
  340          MOVEQ   r9,#1<<23
  350          TEQ     r1,#25
  360          ADDEQ   r9,r9,#1<<17
  370          ADDEQ   r10,r10,#7
  380          TEQ     r1,#121
  390          SUBEQ   r9,r9,#1<<17
  400          SUBEQ   r10,r10,#7
  410          TEQ     r1,#57
  420          ADDEQ   r10,r10,r9,LSR #18
  430          TEQ     r1,#41
  440          SUBEQ   r10,r10,r9,LSR #18
  450          SWI     "OS_Mouse"
  460          TEQ     r2,#0
  470          MOVEQ   r8,#0
  480          TEQ     r8,#0
  490          MOVne   r2,#0
  500          TEQ     r2,#1
  510          MOVEQ   r8,#1
  520          BLEQ    changeshape
  530          TEQ     r2,#2
  540          LDMEQFD r13!,{pc }
  550          TEQ     r2,#4
  560          MOVEQ   r8,#1
  570          BLEQ    changedots
  580          ADD     r12,r12,r0,asr #5
  590          ADD     r11,r11,r1,asr #5
  600          TEQ     r12,#0
  610          ADDMI   r12,r12,#360
  620          CMP     r12,#360
  630          SUBGT   r12,r12,#360
  640          TEQ     r11,#0
  650          ADDMI   r11,r11,#360
  660          CMP     r11,#360
  670          SUBGT   r11,r11,#360
  680          BL      drawshape
  690          BL      swapscr
  700          B       dottylp
  710
  720 .changedots
  730          STMFD   r13!,{r0 ,r14}
  740          LDR     r0,dotshape
  750          ADD     r0,r0,#1
  760          TEQ     r0,#4
  770          MOVEQ   r0,#0
  780          STR     r0,dotshape
  790          LDMFD   r13!,{r0 ,pc}
  800
  810 .changeshape
  820          STMFD   r13!,{r0 ,r14}
  830          LDR     r0,shape
  840          ADD     r0,r0,#1
  850          TEQ     r0,#shapes
  860          MOVEQ   r0,#0
  870          STR     r0,shape
  880          LDMFD   r13!,{r0 ,pc}
  890
  900 .drawshape
  910          STMFD   r13!,{r0-r7 ,r14}
  920          LDR     r7,shape
  930          ADR     r5,shapeadrs
  940          LDR     r5,[r5,r7,LSL #2]
  950          ADR     r6,shapedots
  960          LDR     r6,[r6,r7,LSL #2]
  970          LDR     r7,sqrshape
  980 .shapelp
  990          LDMIA   r5!,{r0 ,r1,r3}
 1000          MOV     r2,r11
 1010          BL      rotate
 1020          MOV     r4,r1
 1030          MOV     r1,r3
 1040          MOV     r2,r12
 1050          BL      rotate
 1060          MOV     r2,r1
 1070          MOV     r1,r4
 1080          BL      plot
 1090          SUB     r2,r7,r2
 1100          BL      ball
 1110          SUBS    r6,r6,#1
 1120          BNE     shapelp
 1130          LDMFD   r13!,{r0-r7 ,pc}
 1140
 1150 .rotate
 1160          STMFD   r13!,{r2-r6 ,r14}
 1170          LDR     r3,angtableadr
 1180          ADD     r6,r3,r2,LSL #3
 1190          LDR     r2,[r6,#0]
 1200          LDR     r3,[r6,#4]
 1210          MUL     r4,r0,r2
 1220          MUL     r6,r1,r3
 1230          SUB     r4,r4,r6
 1240          MUL     r5,r1,r2
 1250          MLA     r5,r0,r3,r5
 1260          MOV     r0,r4,asr #15
 1270          MOV     r1,r5,asr #15
 1280          LDMFD   r13!,{r2-r6 ,pc}
 1290
 1300 .plot
 1310          STMFD   r13!,{r2-r4 ,r14}
 1320          MOV     r3,r1
 1330          ADD     r1,r2,r10
 1340          MOV     r2,r0
 1350          MOV     r0,r9
 1360          BL      divide
 1370          MUL     r1,r0,r2
 1380          MUL     r4,r0,r3
 1390          MOV     r0,r1,asr #15
 1400          MOV     r1,r4,asr #15
 1410          LDMFD   r13!,{r2-r4 ,pc}
 1420
 1430 .ball
 1440          STMFD   r13!,{r0-r3 ,r14}
 1450          MVN     r3,#158
 1460          CMP     r0,r3
 1470          LDMLEFD r13!,{r0-r3 ,pc}
 1480          MVN     r3,#126
 1490          CMP     r1,r3
 1500          LDMLEFD r13!,{r0-r3 ,pc}
 1510          CMP     r0,#158
 1520          LDMGEFD r13!,{r0-r3 ,pc}
 1530          CMP     r1,#126
 1540          LDMGEFD r13!,{r0-r3 ,pc}
 1550          LDR     r3,screen+4
 1560          ADD     r3,r3,r1,LSL #6
 1570          ADD     r3,r3,r1,LSL #8
 1580          ADD     r3,r3,r0
 1590          LDR     r0,coltableadr
 1600          LDRB    r1,[r0,r2]
 1610          LDR     r0,dotshape
 1620          ADD     pc,pc,r0,LSL #5
 1630          EQUD    0
 1640          STRB    r1,[r3,#0]
 1650          STRB    r1,[r3,#1]
 1660          STRB    r1,[r3,#320]
 1670          STRB    r1,[r3,#321]
 1680          LDMFD   r13!,{r0-r3 ,pc}
 1690          EQUD    0
 1700          EQUD    0
 1710          EQUD    0
 1720          STRB    r1,[r3,#0]
 1730          STRB    r1,[r3,#-1]
 1740          STRB    r1,[r3,#1]
 1750          STRB    r1,[r3,#-320]
 1760          STRB    r1,[r3,#320]
 1770          LDMFD   r13!,{r0-r3 ,pc}
 1780          EQUD    0
 1790          EQUD    0
 1800          STRB    r1,[r3,#-1]
 1810          STRB    r1,[r3,#1]
 1820          STRB    r1,[r3,#-320]
 1830          STRB    r1,[r3,#320]
 1840          LDMFD   r13!,{r0-r3 ,pc}
 1850          EQUD    0
 1860          EQUD    0
 1870          EQUD    0
 1880          STRB    r1,[r3,#0]
 1890          STRB    r1,[r3,#-2]
 1900          STRB    r1,[r3,#2]
 1910          STRB    r1,[r3,#-640]
 1920          STRB    r1,[r3,#640]
 1930          LDMFD   r13!,{r0-r3 ,pc}
 1940          EQUD    0
 1950          EQUD    0
 1960
 1970 .divide
 1980          STMFD   r13!,{r2-r6 ,r14}
 1990          EORS    r4,r0,r1
 2000          MOVS    r5,r0
 2010          RSBMI   r0,r0,#0
 2020          TEQ     r1,#0
 2030          RSBMI   r1,r1,#0
 2040 .div32
 2050          TEQ     r1,#0
 2060          BEQ     divend
 2070          MOV     r3,#0
 2080          MOV     r2,#0
 2090          MOV     r6,#32
 2100 .divlp1
 2110          SUBS    r6,r6,#1
 2120          BEQ     divend
 2130          MOVs    r0,r0,asl#1
 2140          BPL     divlp1
 2150 .divlp2
 2160          MOVS    r0,r0,asl#1
 2170          ADC     r3,r3,r3
 2180          CMP     r3,r1
 2190          SUBCS   r3,r3,r1
 2200          ADC     r2,r2,r2
 2210          SUBS    r6,r6,#1
 2220          BNE     divlp2
 2230 .divend
 2240          MOV     r0,r2
 2250          TEQ     r4,#0
 2260          RSBMI   r0,r0,#0
 2270          MOV     r1,r3
 2280          TEQ     r5,#0
 2290          RSBMI   r1,r1,#0
 2300          LDMFD   r13!,{r2-r6 ,pc}
 2310
 2320 .swapscr
 2330          STMFD   r13!,{r0-r5 ,r14}
 2340          LDR     r0,screen
 2350          LDR     r1,screen+4
 2360          STR     r1,screen
 2370          STR     r0,screen+4
 2380          MOV     r0,#112
 2390          LDR     r1,scrbank
 2400          SWI     "OS_Byte"
 2410          LDR     r1,scrbank
 2420          EOR     r1,r1,#3
 2430          STR     r1,scrbank
 2440          MOV     r0,#113
 2450          SWI     "OS_Byte"
 2460          MOV     r0,#19
 2470          SWI     "OS_Byte"
 2480          SWI     &100+12
 2490          LDMFD   r13!,{r0-r5 ,pc}
 2500
 2510 .shape
 2520          EQUD    0
 2530 .dotshape
 2540          EQUD    1
 2550 .screen
 2560          EQUD    148
 2570          EQUD    149
 2580          EQUD    -1
 2590 .scrbank
 2600          EQUD    1
 2610 .sqrshape
 2620          EQUD    SQR(100^2*3)+1
 2630 .coltableadr
 2640          EQUD    coltable
 2650 .angtableadr
 2660          EQUD    angtable
 2670
 2680 ]
 2690 shapeadrs=P%
 2700 P%+=shapes*4
 2710 shapedots=P%
 2720 P%+=shapes*4
 2730 angtable=P%
 2740 FOR a=0 TO 360
 2750  P%!0=(1<<15)*COSRADa
 2760  P%!4=(1<<15)*SINRADa
 2770  P%=FNpc(8)
 2780 NEXT
 2790 coltable=P%
 2800 FOR a=0 TO sqrshape!0*2
 2810  P%?0=FNcol(a/2/sqrshape!0*14+1)
 2820  P%=FNpc(1)
 2830 NEXT
 2840 [OPT pass
 2850          ALIGN
 2860 .shapedata
 2870 ]
 2880 NEXT
 2890 SYS "Hourglass_On"
 2900 FOR shape=0 TO shapes-1
 2910  shapeadrs!(shape*4)=P%
 2920  shapedots!(shape*4)=FNshape(shape
)
 2930 NEXT
 2940 SYS "Hourglass_Off"
 2950 IF more>0 PRINT'"Change dim to =&"
;STR$~more;" near start of progran":END
 2960 MODE 13+128
 2970 OFF
 2980 SYS "OS_Byte",4,2
 2990 SYS "OS_Byte",112,1
 3000 SYS "OS_Byte",112,1
 3010 SYS "OS_ReadVduVariables",screen,s
creen
 3020 screen!0+=&A0A0
 3030 screen!4+=&A0A0
 3040 MOUSE RECTANGLE -32*40,-32*40,32*8
0,32*80
 3050 MOUSE TO 32*5,32*1
 3060 CALL dotty
 3070 MODE 0
 3080 END
 3090 :
 3100 DEF FNcol(shade)
 3110 CASE shade DIV 4 OF
 3120  WHEN 1:=&2C+shade MOD 4
 3130  WHEN 2:=&D0+shade MOD 4
 3140  WHEN 3:=&FC+shade MOD 4
 3150 ENDCASE
 3160 =shade MOD 4
 3170
 3180 DEF FNshape(shape)
 3190 dots=0
 3200 CASE shape OF
 3210  WHEN 0:
 3220   DIM blk 100
 3230   text$="*- Tim Jones -*"
 3240   a=(sqrshape!0*2)/(LENtext$*4)
 3250   FOR b=1 TO LENtext$
 3260    blk?0=ASCMID$(text$,b)
 3270    SYS "OS_Word",10,blk
 3280    FOR c=1 TO 8
 3290     e=((blk?c AND %110000)>>2)+((b
lk?c AND %100)>>1)+(blk?c AND %1)
 3300     FOR d=0 TO 7
 3310      IF e>>d AND 1 :PROCdot((-4+c)
*a,-sqrshape!0+(b*4-d)*a,0)
 3320     NEXT
 3330    NEXT
 3340   NEXT
 3350  WHEN 1:
 3360   FOR a=-100 TO 75 STEP 25
 3370    FOR b=-75 TO 75 STEP 25
 3380     PROCdot(a,b,-100)
 3390     PROCdot(a+25,b,100)
 3400     PROCdot(-100,b,a+25)
 3410     PROCdot(100,b,a)
 3420    NEXT
 3430   NEXT
 3440   FOR a=-100 TO 100 STEP 25
 3450    FOR b=-100 TO 100 STEP 25
 3460     PROCdot(a,-100,b)
 3470     PROCdot(a,100,b)
 3480    NEXT
 3490   NEXT
 3500  WHEN 2:
 3510   FOR a=0 TO 350 STEP 10
 3520    cos=80*COSRADa
 3530    sin=80*SINRADa
 3540     PROCdot(100,cos,sin)
 3550     PROCdot(-100,cos,sin)
 3560     PROCdot(cos,100,sin)
 3570     PROCdot(cos,-100,sin)
 3580     PROCdot(cos,sin,100)
 3590     PROCdot(cos,sin,-100)
 3600    NEXT
 3610  WHEN 3:
 3620   FOR r=20 TO 60 STEP 10
 3630    b=r+40
 3640    FOR a=0 TO 330 STEP 30
 3650     cos=r*COSRADa
 3660     sin=r*SINRADa
 3670     PROCdot(b,cos,sin)
 3680     PROCdot(-b,cos,sin)
 3690     PROCdot(cos,b,sin)
 3700     PROCdot(cos,-b,sin)
 3710     PROCdot(cos,sin,b)
 3720     PROCdot(cos,sin,-b)
 3730    NEXT
 3740   NEXT
 3750  WHEN 4:
 3760   FOR a=-100 TO 100 STEP 20
 3770    FOR b=0 TO 340 STEP 20
 3780     PROCdot(80*COSRADb,a,80*SINRAD
b)
 3790    NEXT
 3800   NEXT
 3810  WHEN 5:
 3820   FOR a=-100 TO -20 STEP 20
 3830    FOR b=0 TO 330 STEP 30
 3840     cos=30*COSRADb
 3850     sin=30*SINRADb
 3860     PROCdot(a,cos,sin)
 3870     PROCdot(cos,a,sin)
 3880     PROCdot(cos,sin,a)
 3890     PROCdot(-a,cos,sin)
 3900     PROCdot(cos,-a,sin)
 3910     PROCdot(cos,sin,-a)
 3920    NEXT
 3930   NEXT
 3940  WHEN 6:
 3950   FOR a=-1 TO .9 STEP .1
 3960    r=100-70*SINRAD(a*90+90)
 3970    FOR b=0 TO 340 STEP 20
 3980     PROCdot(r*COSRADb,a*100,r*SINR
ADb)
 3990    NEXT
 4000   NEXT
 4010  WHEN 7:
 4020   FOR a=0 TO 340 STEP 20
 4030    FOR b=0 TO 330 STEP 30
 4040     r=70+30*COSRADb
 4050     PROCdot(r*COSRADa,30*SINRADb,r
*SINRADa)
 4060    NEXT
 4070   NEXT
 4080  WHEN 8:
 4090   FOR a=0 TO 350 STEP 10
 4100    FOR b=0 TO 300 STEP 60
 4110     r=70+25*COSRADb
 4120     PROCdot(r*COSRADa-35,25*SINRAD
b,r*SINRADa)
 4130     PROCdot(r*COSRADa+35,r*SINRADa
```

```
,25*SINRADb)
 4140    NEXT
 4150   NEXT
 4160 ENDCASE
 4170 =dots
 4180 :
 4190 DEF PROCdot(x,y,z)
 4200 P%!0=x
 4210 P%!4=y
 4220 P%!8=z
 4230 P%=FNpc(12)
 4240 dots+=1
 4250 ENDPROC
 4260 :
 4270 DEF FNpc(b)
 4280 IF more=0 AND P%-code+b>dim more=P
%-code+b
 4290 IF more>0 more+=b:=P%
 4300 =P%+b
```

Listing Info9

```
   10 REM     >IntSort (Info9)
   20 REM By  Albert Hoekstra
   30 REM For 32-bit machines
   40 REM (c) BAU April 1993
   50 :
   60 CLS
   70 VDU 15
   80 PRINT"IntSort"'
   90 INPUT"How many integers",t%
  100 cmax%=300
  110 DIM r%(t%),f%(cmax%)
  120 @%=&20008
  130 FOR n%=1 TO t%
  140  r%(n%)=RND(100)
  150 NEXT
  160 PRINT
  170 PRINT"Input numbers:"
  180 FOR n%=1 TO t%
  190  PRINT r%(n%);
  200 NEXT n%
  210 PRINT
  220 :
  230 time0=TIME
  240 FOR n%=1 TO t%
  250  f%(r%(n%))+=1
  260 NEXT n%
  270 r%()=0
  280 n%=1
  290 c%=0
  300 REPEAT
  310  WHILE f%(c%)>0
  320   r%(n%)=c%
  330  f%(c%)-=1
  340  n%+=1
  350  ENDWHILE
  360  c%+=1
  370 UNTIL n%>t%
  380 :
  390 PRINT"Time taken: ";TIME-time0" cs
ec, press a key..."
  400 p=GET
  410 PRINT'"Sorted numbers:"
  420 FOR n%=1 TO t%
  430  PRINT r%(n%);
  440 NEXT n%
  450 PRINT
  460 END
```

Listing Info10

```
   10 REM     >FracSort (Info10)
   20 REM By  Albert Hoekstra
   30 REM For 32-bit machines
   40 REM (c) BAU April 1993
   50 :
   60 CLS
   70 @%=&20208
   80 PRINT"FracSort"'
   90 INPUT"How many numbers",t%
  100 DIM r(t%),s(t%)
  110 :
  120 FOR n%=1 TO t%
  130  r(n%)=RND(100)+.01*RND(100)
  140 NEXT
  150 r()=r()-50
  160 PRINT'"Input numbers:"
  170 FOR n%=1 TO t%
  180  PRINT r(n%);
  190 NEXT
  200 PRINT
  210 :
  220 PROCfracsort(t%)
  230 :
  240 PRINT"Time taken: ";TIME-time0" cs
ec, press a key..."
  250 p=GET
  260 PRINT"Sorted:"
  270 FOR n%=1 TO t%
  280  PRINT s(n%);
  290 NEXT n%
  300 PRINT
  310 END
  320 :
  330 DEF PROCfracsort(t%)
  340 time0=TIME
  350 max=r(1)
  360 min=r(1)
  370 FOR n%=1 TO t%
  380  IF r(n%)<min THEN min=r(n%)
  390  IF r(n%)>max THEN max=r(n%)
  400 NEXT
  410 cmax%=max-min
  420 r()=r()-min
  430 DIM f%(cmax%+1)
  440 FOR n%=1 TO t%
  450  f%(r(n%))+=1
  460 NEXT n%
  470 :
  480 s%=1
  490 FOR c%=0 TO cmax%+1
  500  f%=f%(c%)
  510  f%(c%)=s%
  520  s%+=f%
  530 NEXTc%
  540 :
  550 s()=-1
  560 FOR n%=1 TO t%
  570  c%=r(n%)
  580  i%=f%(c%)
  590  j%=i%
  600  home=0
  610  REPEAT
  620   IF s(j%)=-1 THEN
  630    s(j%)=r(n%)
  640    home=1
  650   ELSE
  660    IF r(n%)<=s(j%) THEN
  670     nr%=f%(c%+1)-1
  680     REPEAT
  690      s(nr%)=s(nr%-1)
  700      nr%-=1
  710     UNTIL nr%<=j%
  720     s(j%)=r(n%)
  730     home=1
  740    ENDIF
  750   ENDIF
  760   j%+=1
  770  UNTIL home=1
  780 NEXT n%
  790 s()=s()+min
  800 ENDPROC
```

Listing Info11

```
   10 REM     >!RunImage (Info11)
   20 REM     Main Auto program
   30 REM By  Andrew Young
   40 REM     Modified for general signp
osts by Colin Turner
   50 REM For 32-bit machines
   60 REM (c) BAU October 1992/April 199
3
   70 :
   80 key$=INKEY$(0)
   90 open%=1:close%=2:app%=3:mod%=4:vdu
%=5:mode%=6:pin%=7
  100 SYS "Wimp_Initialise",200,&4B53415
4,"Transient"
  110 SYS "XOS_ReadVarVal","Initialise$E
xec",0,-1,0,3 TO ,,r2%
  120 IF r2%=0 THEN PROCfile("Default")
  130 SYS "OS_GetEnv" TO EnvStr$
  140 IF INSTR(EnvStr$," -quit ") THEN
  150   i%=INSTR(EnvStr$,"""")
  160   i%=INSTR(EnvStr$,"""",i%+1)
  170   REPEAT
  180    i%+=1
  190   UNTILMID$(EnvStr$,i%,1)<>" "
  200   command$=MID$(EnvStr$,i%)
  210   ENDIF
  220 IF command$ = "" AND key$ <> "" TH
EN PROCfile(key$)
  230 IF command$ <> "" THEN PROCsignpos
t(command$)
  240 SYS "Wimp_CloseDown"
  250 *Set Initialise$Exec True
  260 END
  270 :
  280 DEF FNget_line(fh%)
  290 s$=""
  300 REPEAT
  310  v%=BGET#fh%
  320  s$+=CHR$v%
  330 UNTIL ((EOF#fh%) OR (v%<32))
  340 =s$
  350 :
  360 DEF FNfunc(fc$)
  370 fc$=MID$(fc$,2,LEN(fc$)-3)
  380 CASE fc$ OF
  390  WHEN "Open":nf%=open%
  400  WHEN "Close":nf%=close%
  410  WHEN "Application":nf%=app%
  420  WHEN "Module":nf%=mod%
  430  WHEN "VDU":nf%=vdu%
  440  WHEN "Mode":nf%=mode%
  450  WHEN "Pin":nf%=pin%
  460 OTHERWISE:
  470  ERROR 1,"Warning: Bad file headin
g"
  480 ENDCASE
  490 =nf%
  500 :
  510 DEF PROCvdu(vs$)
  520 REPEAT
  530  d%=INSTR(vs$,",")
  540  IF d%=0 THEN d%=LEN(vs$)
  550  v%=VAL(LEFT$(vs$,d%))
  560  VDU v%
  570  vs$=RIGHT$(vs$,LEN(vs$)-d%)
  580 UNTIL vs$=""
  590 ENDPROC
  600 :
  610 DEF PROCfile(fn$)
  620 i%=OPENIN("<Initialise$Dir>."+fn$)
  630 PROCread_file
  640 CLOSE #i%
  650 ENDPROC
  660 :
  670 DEF PROCread_file
  680 IF i%<>0 THEN
  690  func%=app%
  700  WHILE NOT EOF #i%
  710   st$=FNget_line(i%)
  720   IF st$<>"" THEN
  730    IF LEFT$(st$,1)="{" THEN
  740     func%=FNfunc(st$)
  750    ELSE
  760     CASE func% OF
  770      WHEN open%:OSCLI("Filer_OpenD
ir "+st$)
  780      WHEN close%:OSCLI("Filer_Clos
eDir "+st$)
  790      WHEN app%:OSCLI("WimpTask "+s
t$)
  800      WHEN mod%:OSCLI("RMLoad "+st$
)
  810      WHEN vdu%:PROCvdu(st$)
  820      WHEN mode%:SYS "Wimp_SetMode"
,VAL(st$)
  830      WHEN pin%:OSCLI("Pin "+st$)
  840     ENDCASE
  850    ENDIF
  860   ENDIF
  870  ENDWHILE
  880 ENDIF
  890 ENDPROC
  900 :
  910 DEF PROCsignpost(fn$)
  920 i%=OPENIN(fn$)
  930 PROCread_file
  940 CLOSE#i%
  950 ENDPROC
```

Listing Info12

```
   10 REM     >AutoDat (Info12)
   20 REM     Create files for Auto
   30 REM By  Andrew Young
   40 REM     & Colin Turner
   50 REM For 32-bit machines
   60 REM (c) BAU April 1993
   70 :
   80 free%=(HIMEM-END-&8000) AND &FFFFF
000
   90 DIM q% &100,w% free%
  100 REPEAT
  110  READ file$
  120  IF file$<>"*" THEN
  130   PRINT file$
  140   READ type%,olen%
  150   IF type%=&FFF OR type%=&FFE OR t
ype%=&FEB THEN
  160    out%=OPENOUT(file$)
  170    REPEAT
  180     READ line$
  190     IF line$<>"*" BPUT#out%,line$
  200    UNTIL line$="*"
  210    CLOSE#out%
  220    SYS "OS_File",18,file$,type%
  230   ELSE
  240    line%=0
  250    d$=""
  260    i%=0
  270    WHILE i%<olen%
  280     b$=FNc
  290     IF b$>="a" AND b$<="z" THEN
  300      off%=-EVAL("&"+FNc+FNc)
  310      FOR k%=0 TO (ASC(b$)-ASC"a"+2
)
  320       w%?i%=w%?(i%+off%)
  330       i%+=1
  340      NEXT
  350     ELSE
  360      w%?i%=EVAL("&"+b$+FNc)
  370      i%+=1
  380     ENDIF
  390    ENDWHILE
  400    SYS "OS_File",10,file$,type%,,w
%,w%+olen%
  410   ENDIF
  420  ENDIF
  430 UNTIL file$="*"
  440 END
  450 :
  460 DEF FNc
  470 LOCAL c$
  480 IF d$="" THEN
  490  READ d$,ch$
  500  line%+=1
  510  $q%=d$
  520  SYS "OS_CRC",0,q%,q%+LEN(d$),1 TO
 crc%
  530  IF crc%<>EVAL("&"+ch$) PRINT"Erro
r in data line ";line%:END
  540 ENDIF
  550 c$=LEFT$(d$,1)
  560 d$=MID$(d$,2)
  570 =c$
  580 :
  590 DATA "!Boot",&FEB,&13E
  600 DATA | !Auto !Boot file
  610 DATA
  620 DATA Set Initialise$Dir <Obey$Dir>
  630 DATA IconSprites <Initialise$Dir>.
!Sprites
  640 DATA Set Alias$@RunType_030 Run <I
nitialise$Dir>.!Run %*0
  650 DATA Set File$Type_030 SignPost
  660 DATA
  670 DATA | Run <Initialise$Dir>.!RunIm
age %*0
  680 DATA
  690 DATA | Use the above line if you w
ish the
  700 DATA | application to be executed
when
  710 DATA | you enter its directory aut
omatically
  720 DATA *
  730 DATA "!Run",&FEB,&95
  740 DATA | !Auto !Run file
  750 DATA
  760 DATA Set Initialise$Dir <Obey$Dir>
  770 DATA IconSprites <Initialise$Dir>.
!Sprites
  780 DATA WimpSlot -min 32k -max 32k
  790 DATA Run <Initialise$Dir>.!RunImag
e %*0
  800 DATA *
  810 DATA "!Sprites",&FF9,&6B8
  820 DATA 030000010a04BC060000D4,6364
  830 DATA 02000216175746Fa14a170,F1D5
  840 DATA 004e1Cb0F07a282Ca2C8001,350F
  850 DATA 00000Ce20e27j0E4444b350,315D
  860 DATA 0007077b31e14e4F77j2800,D0F6
  870 DATA BBBBBBBBB70a57a04q14k2,7AD4
  880 DATA 8a4Fi3Fd5070777777h65c7,60C8
  890 DATA 8a13h76f75p13c37fA9c23f,A6C3
  900 DATA 4A40f14aBEaC2B0bA4f14cA,EA4D
  910 DATA 777c13q14h28g2Cj50bAEiA,55B8
  920 DATA 9nA5o12kC6FFFF0FcFBF0e0,A4C7
  930 DATA 8c14f1Cj28a2AFFFFFFF0a2,6912
  940 DATA Ea04q14k28a4Fi3Fd50F0b4,CF44
  950 DATA 1g65c78a13h76m91nA4k3Cf,1504
  960 DATA 4Ah8B0FcC2fA3g1CiB7h14c,F26F
  970 DATA 8Ag28j48h14aAEw90gB3D40,F2E2
  980 DATA 2000066696C655F303330bF,D500
  990 DATA F04aF210eF607aFE2CaFF80,D2CE
 1000 DATA 0100000CaFF77777777a04d,E59E
 1010 DATA 07b0DaF9F7cCAcCFcD47Fe1,E56C
 1020 DATA 477p147Fj2Df1470g55F7h2,D4BF
 1030 DATA 8gD6q1470q3Ce35v64r78z2,FA2B
 1040 DATA 8z3CrC8A7AAAA7Ab05AAAAa,F455
 1050 DATA 04a077Ad14h11e14gEBfF4a,510F
 1060 DATA F0hAEeB8q14q14t28o4Dz22,2896
 1070 DATA z3Ez5Az76z92zAEzCAzE6qF,280A
 1080 DATA F4F04180401000073 6D616C,83F3
 1090 DATA 6C5F3033300000002a0408,5EA1
 1100 DATA a08a0B000Ba102Ca1498a18,48A3
 1110 DATA 0Ca1C77777777a047777070,A48E
 1120 DATA 000F77FeFFb0C07b1AF7e0C,77AF
 1130 DATA b3D70q18a20g30h0CA707A7,6903
 1140 DATA AAAAAAAAAAAAa54j60gFF0F,7F31
 1150 DATA i0Ci0Cu18z30v5400,480F
 1160 DATA "Default",&FFF,&0
 1170 DATA *
 1180 DATA *
```

Listing Info13

```
   10 REM     >Monkey1 (Info13)
   20 REM By  Richard Talbot-Watkins
   30 REM For 8-bit machines
   40 REM (C) BAU April 1993
   50 :
   60 MODE 7
   70 PRINT "Assembling..."
   80 mem%     = PAGE+&A00
   90 code%    = &900
  100 :
  110 top      = &70
  120 addr     = &74
  130 temp     = &78
  140 wordno   = &7C
  150 thisword = &80
  160 data     = &84
  170 :
  180 FOR N%=0 TO 2 STEP 2
  190 P%=code%
  200 [OPT N%
  210 JMP insertdata
  220 JMP findword
  230 JMP checkword
  240 :
  250 .insertdata
  260 JSR findword
  270 LDY #0
  280 .incnum
  290 LDA (addr),Y
  300 INY
  310 CMP #13
  320 BNE incnum
  330 CLC
  340 LDA (addr),Y
  350 ADC #2
  360 STA (addr),Y
  370 INY
  380 LDA (addr),Y
  390 ADC #0
  400 STA (addr),Y
  410 TYA
  420 CLC
  430 ADC addr
  440 STA addr
  450 LDA addr+1
  460 ADC #0
  470 STA addr+1
  480 LDA top
  490 STA temp
  500 LDA top+1
  510 STA temp+1
  520 .copy
  530 LDY #0
  540 LDA (temp),Y
  550 LDY #2
  560 STA (temp),Y
  570 SEC
  580 LDA temp
  590 SBC #1
  600 STA temp
  610 LDA temp+1
  620 SBC #0
  630 STA temp+1
  640 CMP addr+1
  650 BNE copy
  660 LDA temp
  670 CMP addr
  680 BNE copy
  690 LDA data
  700 LDY #1
  710 STA (temp),Y
  720 LDA data+1
  730 INY
  740 STA (temp),Y
  750 CLC
  760 LDA top
  770 ADC #2
  780 STA top
  790 LDA top+1
  800 ADC #0
  810 STA top+1
  820 RTS
  830 :
  840 .findword
  850 LDA #0
  860 STA addr
  870 STA wordno
  880 STA wordno+1
  890 LDA #(mem% DIV 256)
  900 STA addr+1
  910 .find2
  920 LDA wordno
  930 CMP thisword
```

```
940 BNE find3
950 LDA wordno+1
960 CMP thisword+1
970 BNE find3
980 RTS
990 .find3
1000 JSR nextword
1010 BCC find2
1020 BRK:BRK
1030 EQUS "Word not found"
1040 BRK
1050 :
1060 .checkword
1070 LDA #0
1080 STA addr
1090 STA wordno
1100 STA wordno+1
1110 LDA #(mem% DIV 256)
1120 STA addr+1
1130 .search1
1140 LDY #0
1150 .search2
1160 LDA (addr),Y
1170 CMP &700,Y
1180 BNE notit
1190 INY
1200 CMP #13
1210 BNE search2
1220 RTS
1230 .notit
1240 JSR nextword
1250 BCC search1
1260 LDY #0
1270 .newword
1280 LDA &700,Y
1290 STA (addr),Y
1300 INY
1310 CMP #13
1320 BNE newword
1330 LDA #0
1340 STA (addr),Y
1350 INY
1360 STA (addr),Y
1370 INY
1380 TYA
1390 CLC
1400 ADC top
1410 STA top
1420 LDA top+1
1430 ADC #0
1440 STA top+1
1450 RTS
1460 :
1470 .nextword
1480 LDY #0
1490 .next2
1500 LDA (addr),Y
1510 INY
1520 CMP #13
1530 BNE next2
1540 STY temp
1550 LDA (addr),Y
1560 CLC
1570 ADC temp
1580 STA temp
1590 INY
1600 LDA (addr),Y
1610 ADC #0
1620 STA temp+1
1630 CLC
1640 LDA temp
1650 ADC #2
1660 STA temp
1670 BCC nohigh
1680 INC temp+1
1690 .nohigh
1700 CLC
1710 LDA temp
1720 ADC addr
1730 STA addr
1740 LDA temp+1
1750 ADC addr+1
1760 STA addr+1
1770 INC wordno
1780 BNE next3
1790 INC wordno+1
1800 .next3
1810 LDA addr
1820 CMP top
1830 BNE morewords
1840 LDA addr+1
1850 CMP top+1
1860 BNE morewords
1870 SEC:RTS
1880 .morewords
1890 CLC:RTS
1900 ]
1910 NEXT
1920 :
1930 PRINT "Code assembled."
1940 PRINT "CHAINing part 2..."
1950 CHAIN "Monkey2"
```

Listing Info14

```
10 REM    >Monkey2 (Info14)
20 REM By  Richard Talbot-Watkins
30 REM     & Matthew Godbolt
40 REM For 8-bit machines
50 REM (C) BAU April 1993
60 :
70 MODE 7
80 HIMEM=PAGE+&A00
90 PROCinit
100 PROCbuild
110 PROCoutput
120 END
130 :
140 DEF PROCinit
150 insertdata=&900
160 findword=&903
170 checkword=&906
180 :
190 mem%=PAGE+&A00
200 top=&70
210 addr=&74
220 temp=&78
230 wordno=&7C
240 thisword=&80
250 data=&84
260 :
270 FOR N%=&70 TO &87 STEP 4
280 !N%=0
290 NEXT
300 ENDPROC
310 :
320 DEF PROCbuild
330 INPUT "Enter text filename: "file$
340 file%=OPENIN (file$)
350 IF file%=0 PRINT CHR$129;CHR$7;"Fi
le not found":END
360 PRINT'"OK..Building word tables.."
''
370 :
380 A$="Longest possible string"
390 P$=".:!? "+CHR$13
400 A%=32
410 ?mem%=13:mem%!1=0
420 !top=mem%+3
430 oldword%=0
440 REPEAT
450 IF A%=32 REPEAT:A%=BGET #file%:UNT
IL A%<>32
460 A$=CHR$(A%)
470 REPEAT
480 A%=BGET #file%
490 end%=INSTR(P$,CHR$(A%))
500 IF end%=0 A$=A$+CHR$(A%)
510 UNTIL end%
520 IF LEN(A$)+POS>39 PRINT
530 PRINT A$;" ";
540 $&700=A$
550 CALL checkword
560 word%=!wordno
570 IF oldword% !thisword=oldword%:!da
ta=word%:CALL insertdata
580 oldword%=word%
590 UNTIL end%=6 OR !top>&7B80
600 CLOSE #file%
610 ENDPROC
620 :
630 DEF PROCoutput
640 CLS
650 FOR N%=0 TO 1
660 VDU 132,157,141,131
670 PRINT "Infinite Monkeys - random o
utput"
680 NEXT
690 PRINT SPC(8);CHR$(130);"Press <SHI
FT> to scroll"
700 VDU 28,0,24,39,4,14
710 :
720 REPEAT
730 word%=1
740 REPEAT
750 !thisword=word%
760 CALL findword
770 ptr%=!addr
780 A$=$(ptr%)
790 IF LEN(A$)+POS>39 PRINT
800 IF LEN(A$)=1 AND INSTR(P$,A$) PRIN
T CHR$(8);A$ ELSE PRINT A$;" ";
810 num%=ptr%!(LEN(A$)+1) AND &FFFF
820 IF num% word%=ptr%!(LEN(A$)+3+(RND
(num%)-1 AND -2)) AND &FFFF
830 UNTIL num%=0
840 UNTIL FALSE
```

Listing Info15

```
10 REM    >Why?
20 REM By  Patrick Jacolé
30 REM For 32-bit machines
40 REM (c) BAU April 1993
50 :
60 DIM block% &200,ind% 16,val% 2
70 SYS "Wimp_Initialise",200,&4B53415
4,"Why?"
80 P%=block%:[OPT 2
90 EQUD &0000010E:EQUD &0000013C
100 EQUD &000003EE:EQUD &000002EC
110 EQUD &00000000:EQUD &00000000
120 EQUD &FFFFFFFF:EQUD &04050093
130 EQUD &01070207:EQUD &00020D04
140 EQUD &00000000:EQUD &FFFFFE50
150 EQUD &000002E0:EQUD &00000000
160 EQUD &0000003D:EQUD &00003000
170 EQUD &00000001:EQUD &01B002E0
180 EQUD &6F727245:EQUD &FFFF0D72
190 EQUD &0000003C:EQUD &00000004
200 EQUD &00000072:EQUD &FFFFFEB0
210 EQUD &0000026C:EQUD &FFFFFFEC
220 EQUD &1780613D:EQUD &0000944C
230 EQUD &00009472:EQUD &00000026
240 EQUD &00000120:EQUD &FFFFFE64
250 EQUD &000001BA:EQUD &FFFFFE9C
260 EQUD &C701903D:EQUD &740D4B4F
270 EQUD &65756E69:EQUD &780D3E0D
280 EQUD &0000000E:EQUD &FFFFFF30
290 EQUD &00000060:EQUD &FFFFFF7C
300 EQUD &D700601A:EQUD &6F727265
310 EQUD &650D0D72:EQUD &7F0D3E64
320 EQUD &0000027E:EQUD &FFFFFF30
330 EQUD &000002D0:EQUD &FFFFFF7C
340 EQUD &D700601A:EQUD &6F727265
350 EQUD &650D0D72:EQUD &7F0D3E64
360 EQUD &61656C50:EQUD &63206573
370 EQUD &6B63696C:EQUD &206E6F20
380 EQUD &74204B4F:EQUD &6E69206F
390 EQUD &6C617473:EQUD &6F6D206C
400 EQUD &656C7564:EQUD &0D4C0D2E
410 EQUD &D700601A:EQUD &6F727265
420 EQUD &650D0D72:EQUD &7F0D3E64
430 EQUD &0000027E:EQUD &FFFFFF30
440 EQUD &000002D0:EQUD &FFFFFF7C
450 EQUD &D700601A:EQUD &6F727265
460 EQUD &650D0D72:]
470 SYS "Wimp_CreateWindow",,block% TO
 handle%
480 P%=block%:[OPT 2
490 EQUD handle%  :EQUD &00000072
500 EQUD &FFFFFEB0:EQUD &0000026C
510 EQUD &FFFFFFEC:EQUD &1700613D
520 EQUD ind%     :EQUD val%
530 EQUD &00000016:]
540 P%=ind%:[OPT 2
550 EQUD &20216148:EQUD &69727041
560 EQUD &6F46206C:EQUD &0D216C6F:]
570 $val%="L"
580 SYS "Wimp_CreateIcon",,block%
590 !block%=handle%
600 SYS "Wimp_GetWindowState",,block%
610 SYS "Wimp_OpenWindow",,block%
620 :
630 quit%=FALSE
640 REPEAT
650 SYS "Wimp_Poll",0,block% TO reason
%
660 CASE reason% OF
670 WHEN 2:SYS "Wimp_OpenWindow",,bloc
k%
680 WHEN 6:IF block%!16=1 THEN quit%=T
RUE
690 WHEN 17,18:IF !block%=0 THEN quit%
=TRUE
700 ENDCASE
710 UNTIL quit%
720 SYS "Wimp_CloseDown":END
```

Listing Info16

```
10 REM    >SprDem6 (Info16)
20 REM By  DA
30 REM For 32-bit machines
40 REM (c) BAU April 1993
50 :
60 MODE 13
70 OFF
80 PROCinit_sprite_area
90 PROCdemo
100 END
110 :
120 DEF PROCinit_sprite_area
130 sprite_op%=&2E
140 size%=128
150 scale=256/size%
160 area_size%=size%*size%+&100
170 DIM sprites% area_size%,zoom% 16
180 !sprites%=area_size%
190 sprites%!8=16
200 SYS sprite_op%,&109,sprites%
210 SYS sprite_op%,&10F,sprites%,"demo
",,size%,size%,13
220 !zoom%=&100*scale
230 zoom%!4=&100*scale
240 zoom%!8=&100
250 zoom%!12=&100
260 SYS sprite_op%,&3E TO ,,,save_area
_size%
270 DIM save_area% save_area_size%
280 ENDPROC
290 :
300 DEF PROCdemo
310 REPEAT
320  FOR c%=0 TO 1023
330   PROCinsert(RND(size%/4)+size%*3/
8,RND(size%/4)+size%*3/8,c%/4)
340   SYS sprite_op%,&134,sprites%,"de
mo",128,0,,zoom%,-1
350  NEXT
360 UNTIL FALSE
370 ENDPROC
380 :
390 DEF PROCinsert(x%,y%,c%)
400 SYS sprite_op%,&120,sprites%,"demo
",0
410 SYS sprite_op%,&120,sprites%,"demo
",size%-2
420 SYS sprite_op%,&11F,sprites%,"demo
",y%-1
430 SYS sprite_op%,&11F,sprites%,"demo
",y%
440 SYS sprite_op%,&12E,sprites%,"demo
",0
450 SYS sprite_op%,&12E,sprites%,"demo
",size%-2
460 SYS sprite_op%,&12D,sprites%,"demo
",x%-1
470 SYS sprite_op%,&12D,sprites%,"demo
",x%
480 !save_area%=0
490 SYS sprite_op%,&13C,sprites%,"demo
",save_area% TO r0,r1,r2,r3
500 GCOL (c% AND 63) TINT (c% AND 192)
510 LINE 0,y%*4,size%*4-1,y%*4
520 LINE x%*4,0,x%*4,size%*4-1
530 SYS sprite_op%,r0,r1,r2,r3
540 ENDPROC
```

Listing Info17

```
10 REM    >SprDem7 (Info17)
20 REM By  DA
30 REM For 32-bit machines
40 REM (c) BAU April 1993
50 :
60 MODE 13
70 OFF
80 VDU 19,0,24,&80,&80,&80
90 PROCinit_sprite_area
100 PROCmake_picture
110 PROCdemo
120 END
130 :
140 DEF PROCinit_sprite_area
150 sprite_op%=&2E
160 area_size%=161*1024
170 DIM sprites% area_size%,zoom% 16
180 !sprites%=area_size%
190 sprites%!8=16
200 SYS sprite_op%,&109,sprites%
210 SYS sprite_op%,&10F,sprites%,"pict
ure",,320,256,13
220 SYS sprite_op%,&11D,sprites%,"pict
ure"
230 SYS sprite_op%,&3E TO ,,,save_area
_size%
240 DIM save_area% save_area_size%
250 ENDPROC
260 :
270 DEF PROCmake_picture
280 PRINT"Please wait..."
290 m$="BBC Acorn User"
300 !save_area%=0
310 SYS sprite_op%,&13C,sprites%,"pict
ure",save_area% TO r0,r1,r2,r3
320 GCOL 128+%101010
330 CLG
340 FOR i%=1 TO 30
350  x%=RND(1280)-512
360  y%=RND(1280)-128
370  xscale=1+RND(1)*4
380  yscale=1+RND(1)*4
390  PROCmessage(x%-8,y%-8,xscale,ysca
le,m$,0)
400  PROCmessage(x%,y%,xscale,yscale,m
$,RND(256)-1)
410 NEXT
420 SYS sprite_op%,r0,r1,r2,r3
430 ENDPROC
440 :
450 DEF PROCmessage(x%,y%,xscale,yscal
e,t$,c%)
460 LOCAL i%
470 !zoom%=&100*xscale
480 zoom%!4=&100*yscale
490 zoom%!8=&100
500 zoom%!12=&100
510 GCOL (c% AND 63) TINT (c% AND 192)
520 FOR i%=1 TO LEN(t$)
530  SYS sprite_op%,&33,ASCMID$(t$,i%)
,,x%,y%,,zoom%
540  x%+=32*xscale
550 NEXT
560 ENDPROC
570 :
580 DEF PROCdemo
590 n%=8
600 DIM r%(n%),col%(n%),tint%(n%)
610 FOR i%=0 TO n%-1
620  IF i%<7 col%(i%)=1<<i% ELSE tint%
(i%)=1<<i%
630  r%(i%)=-64*i%
640 NEXT
650 CLS
660 REPEAT
670  !save_area%=0
680  SYS sprite_op%,&13D,sprites%,"pic
ture",save_area% TO r0,r1,r2,r3
690  GCOL 128 TINT 0
700  CLG
710  FOR i%=0 TO n%-1
720   IF r%(i%)>0 THEN
730    GCOL col%(i%) TINT tint%(i%)
740    CIRCLE FILL 640,512,r%(i%)
750   ENDIF
760   r%(i%)+=16
770  NEXT
780  SYS sprite_op%,r0,r1,r2,r3
790  WAIT
800  SYS sprite_op%,&122,sprites%,"pic
ture",0,0,8
810 UNTIL r%(7)>820
820 ENDPROC
```

Listing Info18

```
10 REM    >SprDem8 (Info18)
20 REM By  DA
30 REM For 32-bit machines
40 REM (c) BAU April 1993
50 :
60 MODE 13
70 OFF
80 PROCinit_sprite_area
90 PROCcreate_mess("BBC Acorn User Sp
rite Demo")
100 PROCselect_mode(3)
110 PROCanimate
120 END
130 :
140 DEF PROCinit_sprite_area
150 sprite_op%=&2E
160 area_size%=30*1024
170 DIM sprites% area_size%,zoom% 16,t
ab% &100,cols%(3)
180 cols%()=2,4,16,256
190 !sprites%=area_size%
200 sprites%!8=16
210 SYS sprite_op%,&109,sprites%
220 zoom%!8=&100
230 zoom%!12=&100
240 ENDPROC
250 :
260 DEF PROCcreate_mess(m$)
270 n%=LEN(m$)
280 DIM sp%(n%)
290 FOR i%=0 TO n%-1
300  c%=RND(255)
310  COLOUR (c% AND 63) TINT (c% AND 1
92)
320  PRINTTAB(0,0)MID$(m$,i%+1,1)
330  SYS sprite_op%,&110,sprites%,STR$
i%,,0,992,31,1023
340  SYS sprite_op%,&118,sprites%,STR$
i% TO ,,sp%(i%)
350  SYS sprite_op%,&21D,sprites%,sp%(
i%)
360  FOR x%=0 TO 7
370   FOR y%=0 TO 7
380    SYS sprite_op%,&229,sprites%,sp
%(i%),x%,y% TO ,,,,,c%,t%
390    IF c%=0 AND t%=0 SYS sprite_op%
,&22C,sprites%,sp%(i%),x%,y%,0
400   NEXT
```

```
  410  NEXT
  420 NEXT
  430 ENDPROC
  440 :
  450 DEF PROCanimate
  460 bank%=1
  470 REPEAT
  480  FOR a%=0 TO 359
  490   WAIT
  500   SYS "OS_Byte",112,bank%
  510   bank%=3-bank%
  520   SYS "OS_Byte",113,bank%
  530   SYS "ColourTrans_SetGCOL",&80808
000,,,128
  540   CLG
  550   PRINTTAB(0,0);cols%(cur_cols%)
  560   FOR i%=0 TO n%-1
  570    a=a%+3*i%
  580    x%=640+400*COSRAD(a*3)
  590    y%=512+400*SINRAD(a*7)
  600    zoom%!0=&100+&300*ABS(COSRAD(a)
)
  610    zoom%!4=&100+&300*ABS(SINRAD(a)
)
  620    SYS "ColourTrans_SetGCOL",0,,,1
28
  630    SYS sprite_op%,&232,sprites%,sp
%(i%),x%-8,y%-8,,zoom%
  640    SYS sprite_op%,&234,sprites%,sp
%(i%),x%,y%,8,zoom%,ctab%
  650   NEXT
  660   i%=INKEY(0)-48
  670   IF i%>=0 AND i%<4 PROCselect_mod
e(i%)
  680  NEXT
  690 UNTIL FALSE
  700 ENDPROC
  710 :
  720 DEF PROCselect_mode(cols%)
  730 cur_cols%=cols%
  740 CASE cols% OF
  750  WHEN 0:MODE 4
  760  WHEN 1:
  770   MODE 1
  780   FOR i%=0 TO 3
  790    COLOUR i%,i%*&50,i%*&50,i%*&50
  800   NEXT
  810  WHEN 2:
  820   MODE 9
  830   FOR i%=0 TO 7
  840    COLOUR i%+8,i%*&20,i%*&20,i%*&2
0
  850   NEXT
  860  WHEN 3:MODE 13
  870 ENDCASE
  880 OFF
  890 IF MODE=13 THEN
  900  ctab%=-1
  910 ELSE
  920  SYS "ColourTrans_SelectTable",13,
0,-1,-1,tab%
  930  ctab%=tab%
  940 ENDIF
  950 VDU 19,0,24,&80,&80,&80
  960 ENDPROC
```

Listing Info19

```
   10 REM     >SprDem9 (Info19)
   20 REM By  DA
   30 REM For 32-bit machines
   40 REM (c) BAU April 1993
   50 :
   60 MODE 13
   70 OFF
   80 PROCinit_sprite_area
   90 PROCdemo
  100 END
  110 :
  120 DEF PROCinit_sprite_area
  130 sprite_op%=&2E
  140 size%=100
  150 area_size%=2*size%*size%+1024
  160 DIM sprites% area_size%,dest% 32
  170 !sprites%=area_size%
  180 sprites%!8=16
  190 SYS sprite_op%,&109,sprites%
  200 SYS sprite_op%,&10F,sprites%,"test
",,size%,size%,13
  210 SYS sprite_op%,&11D,sprites%,"test
"
  220 SYS sprite_op%,&118,sprites%,"test
" TO ,,sp%
  230 SYS sprite_op%,&3E TO ,,,save_area
_size%
  240 DIM save_area% save_area_size%
  250 ENDPROC
  260 :
  270 DEF PROCdemo
  280 PRINT "Please wait..."
  290 !save_area%=0
  300 SYS sprite_op%,&23C,sprites%,sp%,s
ave_area% TO r0,r1,r2,r3
  310 FOR i%=0 TO 40
  320  c%=RND(255)
  330  GCOL (c% AND 63) TINT (c% AND 192
)
  340  CIRCLE FILL size%+RND(size%*2),si
ze%+RND(size%*2),RND(size%/4)
  350 NEXT
  360 FOR x%=0 TO size%-1
  370  FOR y%=0 TO size%-1
  380   SYS sprite_op%,&229,sprites%,sp%
,x%,y% TO ,,,,,c%,t%
  390   IF c%=0 AND t%=0 SYS sprite_op%,
&22C,sprites%,sp%,x%,y%,0
  400  NEXT
  410 NEXT
  420 SYS sprite_op%,r0,r1,r2,r3
  430 MOUSE ON 1
  440 ORIGIN 640,512
  450 MOUSE TO 300,300
  460 VDU 19,0,24,&80,&80,&80
  470 bank%=1
  480 shadow%=TRUE
  490 oldb%=0
  500 REPEAT
  510  WAIT
  520  SYS "OS_Byte",112,bank%
  530  bank%=3-bank%
  540  SYS "OS_Byte",113,bank%
  550  COLOUR 128+%101010
  560  CLS
  570  MOUSE x%,y%,b%
  580  IF b%<>oldb% THEN
  590   oldb%=b%
  600   IF oldb%<>0 shadow%=NOT shadow%
  610  ENDIF
  620  x%=x%<<9
  630  y%=y%<<9
  640  dest%!0=-x%
  650  dest%!4=-y%
  660  dest%!8=y%
  670  dest%!12=-x%
  680  dest%!16=x%
  690  dest%!20=y%
  700  dest%!24=-y%
  710  dest%!28=x%
  720  ORIGIN 640-16,512-16
  730  IF shadow% SYS sprite_op%,&237,sp
rites%,sp%,%01,,,dest%
  740  ORIGIN 640,512
  750  SYS sprite_op%,&238,sprites%,sp%,
%01,,8,dest%
  760 UNTIL FALSE
  770 ENDPROC
```

BIO

Listing Bio1

```
   10 REM     >HexDump
   20 REM     BIO hex dump module
   30 REM By  Dave Lawrence
   40 REM For 32-bit machines
   50 REM (c) BAU April 1993
   60 END
   70 :
   80 DEF FNhexdump_name = "Hex dump"
   90 DEF FNhexdump_args = "-in * -out T
ext -send"
  100 :
  110 DEF FNhexdump_init
  120 hex_form%=0
  130 hex_width%=16
  140 hex_ascii%=TRUE
  150 hex_length%=16
  160 PROCwrite_in_icon(wind_hand%,2,STR
$hex_width%)
  170 PROCwrite_in_icon(wind_hand%,7,STR
$hex_length%)
  180 PROCset_button(wind_hand%,3,ABS(he
x_form%=0))
  190 PROCset_button(wind_hand%,4,ABS(he
x_form%=1))
  200 PROCset_button(wind_hand%,5,ABShex
_ascii%)
  210 =0
  220 :
  230 DEF FNhexdump_mouse(mx%,my%,mb%,mh
%,mi%)
  240 IF (mi%=3 OR mi%=4) THEN
  250  IF (mb% AND 1) AND FNbutton_state
(mh%,mi%)=0 PROCset_button(mh%,mi%,1)
  260  IF mi%-3<>hex_form% THEN
  270   hex_form%=mi%-3
  280   hex_width%=VALFNicon_text(mh%,2)
  290   CASE hex_form% OF
  300    WHEN 0: hex_width%=hex_width%*4
  310    WHEN 1: hex_width%=hex_width% D
IV 4
  320   ENDCASE
  330   PROCwrite_in_icon(mh%,2,STR$hex_
width%)
  340  ENDIF
  350 ENDIF
  360 =0
  370 :
  380 DEF FNhexdump_key(wh%,ic%,cx%,cy%,
ch%,ci%,key%)
  390 =0
  400 :
  410 DEF FNhexdump(in$,out$)
  420 LOCAL in%,out%,line$,i%,b%,str$
  430 in%=OPENIN(in$)
  440 out%=OPENOUT(out$)
  450 togo%=0
  460 hex_width%=VALFNicon_text(wind_han
d%,2)
  470 hex_length%=VALFNicon_text(wind_ha
nd%,7)
  480 hex_ascii%=FNbutton_state(wind_han
d%,5)
  490 CASE hex_form% OF
  500  WHEN 0:wide%=hex_width%
  510  WHEN 1:wide%=hex_width%*4
  520 ENDCASE
  530 WHILE NOT EOF#in%
  540  PROChourglass(PTR#in%,EXT#in%)
  550  IF togo%=0 THEN
  560   IF wide% MOD 16=0 THEN
  570    line$="Address  :"
  580    FOR i%=0 TO (wide%-1) DIV 4
  590     IF hex_form%=1 line$+=" "
  600     FOR j%=0 TO 3
  610      IF hex_form%=0 line$+=" "+RIG
HT$("00"+STR$~(i%*4+j%),2)
  620      IF hex_form%=1 line$+=RIGHT$(
"00"+STR$~(i%*4+3-j%),2)
  630      NEXT
  640     NEXT
  650     IF hex_ascii% line$+=" : "+STRI
NG$((wide%-10)/2," ")+"ASCII data"
  660     PROCbput(out%,"")
  670     PROCbput(out%,line$)
  680    ENDIF
  690    PROCbput(out%,"")
  700    togo%=hex_length%
  710   ENDIF
  720   addr$=RIGHT$("00000000"+STR$~PTR#
in%,8)+" :"
  730   line$=""
  740   word$=""
  750   ascii$=" : "
  760   i%=0
  770   WHILE NOT EOF#in% AND i%<wide%
  780    b%=BGET#in%
  790    word$=RIGHT$("00"+STR$~b%,2)+wor
d$
  800    IF LENword$=hex_form%*6+2 line$+
=" "+word$:word$=""
  810    IF b%<32 OR b%=127 b%=ASC"."
  820    IF hex_ascii% ascii$+=CHR$b%
  830    i%+=1
  840   ENDWHILE
  850   IF word$<>"" line$+=" "+RIGHT$("x
xxxxxx"+word$,8)
  860   line$=addr$+line$+STRING$(hex_wid
th%*(hex_form%*6+3)-LENline$," ")
  870   IF hex_ascii% line$+=ascii$
  880   PROCbput(out%,line$)
  890   togo%-=1
  900 ENDWHILE
  910 CLOSE #in%
  920 CLOSE #out%
  930 =0
```

Listing Bio2

```
   10 REM     >Hex_Dat
   20 REM     Create HexDump files
   30 REM By  Dave Lawrence
   40 REM For 32-bit machines
   50 REM (c) BAU April 1993
   60 :
   70 DIM q% &100,w% &1000
   80 REPEAT
   90  READ file$
  100  IF file$<>"*" THEN
  110   PRINT file$
  120   READ type%,olen%
  130   IF type%=&FFF OR type%=&FFE OR t
ype%=&FEB THEN
  140    out%=OPENOUT(file$)
  150    REPEAT
  160     READ line$
  170     IF line$<>"*" BPUT#out%,line$
  180    UNTIL line$="*"
  190    CLOSE#out%
  200    SYS "OS_File",18,file$,type%
  210   ELSE
  220    line%=0
  230    d$=""
  240    i%=0
  250    WHILE i%<olen%
  260     b$=FNc
  270     IF b$>="a" AND b$<="z" THEN
  280      off%=-EVAL("&"+FNc+FNc)
  290      FOR k%=0 TO (ASC(b$)-ASC"a"+2
)
  300       w%?i%=w%?(i%+off%)
  310       i%+=1
  320      NEXT
  330     ELSE
  340      w%?i%=EVAL("&"+b$+FNc)
  350      i%+=1
  360     ENDIF
  370    ENDWHILE
  380    SYS "OS_File",10,file$,type%,,w
%,w%+olen%
  390   ENDIF
  400  ENDIF
  410 UNTIL file$="*"
  420 END
  430 :
  440 DEF FNc
  450 LOCAL c$
  460 IF d$="" THEN
  470  READ d$,ch$
  480  line%+=1
  490  $q%=d$
  500  SYS "OS_CRC",0,q%,q%+LEN(d$),1 TO
 crc%
  510  IF crc%<>EVAL("&"+ch$) PRINT"Erro
r in data line ";line%:END
  520 ENDIF
  530 c$=LEFT$(d$,1)
  540 d$=MID$(d$,2)
  550 =c$
  560 :
  570 DATA "Sprites",&FF9,&20C
  580 DATA 010000010a041002a09a04,A079
  590 DATA 68657864756D7034a170004,FDCC
  600 DATA e1Cb0C07a28ACa2Ca04000C,B678
  610 DATA b1DFFFFFFa04FF00DDDDDa,65A4
  620 DATA 04DD00BBBBBBa04BB009999,D404
  630 DATA 99a04990077777a0477005,B91C
  640 DATA 55555a04550033333a0433,524A
  650 DATA e4Fa764499a049900EEEE00,EE09
  660 DATA a04a86CCa8Aa04DDa91a04a,E107
  670 DATA 18BBa1CBB00558800a04a70,8C27
  680 DATA BBa74a0400BBFFa04FF1111,1A47
  690 DATA 1111a04d07b0DaC8q140021,980E
  700 DATA 177177171177272la0672a0,5A3C
  710 DATA 612aF0721771a3F1772c067,33CD
  720 DATA 3711117b3Ca28f1431b34aF,FF06
  730 DATA C7177b28d3C73a0Cc28q787,93F6
  740 DATA 337a58a5E1172a2E77a6AaE,8530
  750 DATA 51771713117a5521a5611b6,F7E9
  760 DATA Ac141173b2211a7F2127d14,9AA3
  770 DATA 733731aA0a91bA012d3CrDC,2C02
  780 DATA 312771a647777317713h781,A586
  790 DATA 27121a64a4F17gF07777b14,5992
  800 DATA 77aE2h14bDC12a28j3CqC80,5C0C
  810 DATA 0,1400
  820 DATA "Templates",&FEC,&1E8
  830 DATA FFFFFFFF00000000a04c072,B37F
  840 DATA Ca0DBC01000001a15486578,D254
  850 DATA 44756D700Df2034a180Aa1C,3C66
  860 DATA 1603000D0b21e39b441200,7A56
  870 DATA 01870702070103010Cd4FFC,C738
  880 DATA a5805d5A3Db4D30d54b5858,D3F4
  890 DATA a60b7814a7908a7D0Aa8188,4FE0
  900 DATA a898Aa89B8a91116200C757,A807
  910 DATA 696474683A0D0D6E3A0D7Fb,6FFF
  920 DATA 20C4e20F4e20466F726D617,54E2
  930 DATA 43Ac2096aC18AaC9EEaC9BA,FCAC
  940 DATA aD13DE1000767aC46AaC8aA,CAFD
  950 DATA B009Ce40b78b4013B121176,CABA
  960 DATA FaE475aE8bAE3AaF0b60180,647D
  970 DATA 2f20011787aEC8Di20b60C8,7B51
  980 DATA aFCB6c4020179FaD4A5e40b,9A7B
  990 DATA C04CeC07CeC04C656E67bC1,9D2A
 1000 DATA fA0b20bA0b20bA0B3aA0B7a,F979
 1010 DATA A404aFC4865782064756D70,9B7E
 1020 DATA 2073657475700D39390D413,D0E6
 1030 DATA 02D390D42797465730D5372,F1E7
 1040 DATA 6164696F6F66662Cd096E0D,DFE9
 1050 DATA 576F7264r184153434949 0D,9318
 1060 DATA 736F7074b2Eb076Ea4Cd4D0,EE12
 1070 DATA D,3300
 1080 DATA *
```

Listing Bio3

```
   10 REM     >ToneDial
   20 REM     BIO tone dial module
   30 REM By  DA & DL
   40 REM For 32-bit machines
   50 REM (c) BAU April 1993
   60 END
   70 :
   80 DEF FNtonedial_name = "Tone Dialle
r"
   90 DEF FNtonedial_args = "-in Text"
  100 :
  110 DEF FNtonedial_init
  120 LOCAL col$,row$,a%,col%,row%
  130 DIM dial_tone1%(12),dial_tone2%(12
)
  140 col$="160167174"
  150 row$="122130136142"
  160 a%=1
  170 FOR row%=0 TO 3
  180  FOR col%=0 TO 2
  190   dial_tone1%(a%)=VALMID$(col$,col
%*3+1,3)
  200   dial_tone2%(a%)=VALMID$(row$,row
%*3+1,3)
  210   a%+=1
  220  NEXT
  230 NEXT
  240 PROCwrite_in_icon(wind_hand%,1,"")
  250 =0
  260 :
  270 DEF FNtonedial_mouse(mx%,my%,mb%,m
h%,mi%)
  280 =(mi%=2)
  290 :
  300 DEF FNtonedial_key(wh%,ic%,cx%,cy%
,ch%,ci%,key%)
  310 =(key%=13)
  320
  330 DEF FNtonedial(file$)
  340 LOCAL n$,i%,a$,in%,t%,dig%
  350 SYS "Sound_Configure" TO i%
  360 IF i%<2 VOICES 2
  370 *ChannelVoice 1 WaveSynth-Beep
  380 *ChannelVoice 2 WaveSynth-Beep
  390 SYS "Sound_QBeat",-2
  400 IF file$="" THEN
  410  PROCdial(FNicon_text(wind_hand%,1
))
  420 ELSE
  430  in%=OPENIN(file$)
  440  PROCdial(GET$#in%)
  450  CLOSE #in%
  460 ENDIF
  470 =0
  480 :
  490 DEF PROCdial(n$)
  500 i%=0
  510 WHILE n$<>""
  520  a%=INSTR(" 123456789*0#",LEFT$(n$
,1))
```

```
  53Ø  IF a%>Ø THEN
  54Ø   tone1%=dial_tone1%(a%-1)
  55Ø   tone2%=dial_tone2%(a%-1)
  56Ø   IF tone1%=Ø vol%=Ø ELSE vol%=&FF
F8ØØØØ
  57Ø   SYS "Sound_QSchedule",i%*3Ø+5,,v
ol% OR 1,&4ØØØØ OR tone1%
  58Ø   SYS "Sound_QSchedule",     -1,,v
ol% OR 2,&4ØØØØ OR tone2%
  59Ø   i%+=1
  6ØØ  ENDIF
  61Ø  n$=MID$(n$,2)
  62Ø ENDWHILE
  63Ø ENDPROC
```

Listing Bio4

```
   1Ø REM     >Tone_Dat
   2Ø REM     Create ToneDial files
   3Ø REM By  DA & DL
   4Ø REM For 32-bit machines
   5Ø REM (c) BAU April 1993
   6Ø :
   7Ø DIM q% &1ØØ,w% &1ØØØ
   8Ø REPEAT
   9Ø  READ file$
  1ØØ  IF file$<>"*" THEN
  11Ø   PRINT file$
  12Ø   READ type%,olen%
  13Ø   IF type%=&FFF OR type%=&FFE OR t
ype%=&FEB THEN
  14Ø    out%=OPENOUT(file$)
  15Ø    REPEAT
  16Ø     READ line$
  17Ø     IF line$<>"*" BPUT#out%,line$
  18Ø    UNTIL line$="*"
  19Ø    CLOSE#out%
  2ØØ    SYS "OS_File",18,file$,type%
  21Ø   ELSE
  22Ø    line%=Ø
  23Ø    d$=""
  24Ø    i%=Ø
  25Ø    WHILE i%<olen%
  26Ø     b$=FNc
  27Ø     IF b$>="a" AND b$<="z" THEN
  28Ø      off%=-EVAL("&"+FNc+FNc)
  29Ø      FOR k%=Ø TO (ASC(b$)-ASC"a"+2
)
  3ØØ       w%?i%=w%?(i%+off%)
  31Ø       i%+=1
  32Ø      NEXT
  33Ø     ELSE
  34Ø      w%?i%=EVAL("&"+b$+FNc)
  35Ø      i%+=1
  36Ø     ENDIF
  37Ø    ENDWHILE
  38Ø    SYS "OS_File",1Ø,file$,type%,,w
%,w%+olen%
  39Ø   ENDIF
  4ØØ  ENDIF
  41Ø UNTIL file$="*"
  42Ø END
  43Ø :
  44Ø DEF FNc
  45Ø LOCAL c$
  46Ø IF d$="" THEN
  47Ø  READ d$,ch$
  48Ø  line%+=1
  49Ø  $q%=d$
  5ØØ  SYS "OS_CRC",Ø,q%,q%+LEN(d$),1 TO
 crc%
  51Ø  IF crc%<>EVAL("&"+ch$) PRINT"Erro
r in data line ";line%:END
  52Ø ENDIF
  53Ø c$=LEFT$(d$,1)
  54Ø d$=MID$(d$,2)
  55Ø =c$
  56Ø :
  57Ø DATA "Sprites",&FF9,&36Ø
  58Ø DATA Ø1ØØØØØØ1Øa Ø464Ø3ØØØØ54,E6B6
  59Ø DATA aØ4746F6E656469616C34a1,B7Ø3
  6ØØ DATA 8Ø4e1Ca23ØØØ7a28ACbØCØ2,CA3A
  61Ø DATA ØØØØØCb14FFFFFFaØ4FFØØD,2A7
  62Ø DATA DDDDDaØ4DDØØBBBBBBaØ4BB,9225
  63Ø DATA ØØ999999aØ499ØØ777777aØ,CD69
  64Ø DATA 477ØØ55555aØ455ØØ33333,E59A
  65Ø DATA 3aØ433e4Fa764499aØ499ØØ,2C13
  66Ø DATA EEEEØØaØ4a86CCa8AaØ4DDa,49Ø6
  67Ø DATA 91aØ4a18BBa1CBBØØ5588ØØ,AC8
  68Ø DATA aØ4a7ØBBa74aØ4ØØBBFFaØ4,8AB8
  69Ø DATA FFa77a7AcØ6DDDD2D7777b3,F65D
  7ØØ DATA 7131Ø13Ø1111bØ7DØDD7D7,CF57
  71Ø DATA 7D27Db4B23222230222202a,C1F7
  72Ø DATA Ø7a14DDDDf1431222212a1B,EAE7
  73Ø DATA D1a1472c3C7755357357553,D9ØC
  74Ø DATA 3aØ7D3a11o5Øa617227m5Øa,F36E
  75Ø DATA 11bFD15ØDD7Da1615Øa7672,C853
  76Ø DATA c28jAØb8DnAØa8Ao5ØaDA7D,BA63
  77Ø DATA 27m5Øa8A7D72n5ØhDCgFØDD,6CC4
  78Ø DATA eDCkAØeDCkAØeDCaF3cØ6cØ,8294
  79Ø DATA BFØFFFFØØFFFFFFFFaØ4dØ7,A5D9
  8ØØ DATA ØFa13ØFFØo14a2Ap14o3Cc4,27A
  81Ø DATA Dq14q28aEDm78a8Cq14q14a,5FDC
  82Ø DATA 8DnB4c51p14aDEq14n78qDC,3B6F
  83Ø DATA b9Dq14q14cF3FF,2F26
  84Ø DATA "Templates",&FEC,&1Ø6
  85Ø DATA FFFFFFFFØØØØØØØØaØ4cØ72,B37F
  86Ø DATA CaØDDAa11Ø1a15546F6E654,C61E
  87Ø DATA 469616CØD77253Db2446a15,F5AF
  88Ø DATA 2ØØ2ØØØØ28Ø4ØØØØ82aØ8f3,9782
  89Ø DATA 8b4412ØØØ387Ø7Ø2Ø7Ø1Ø3Ø,BDF3
  9ØØ DATA 1ØCd4FFCa58Ø5d5A3Db4D3Ø,F963
  91Ø DATA d54b58B8e34ØDa79Ø3a7D12,CA5F
  92Ø DATA a81B6a8994a89E6a91396ØØ,C86
  93Ø DATA Ø174E756D6265723AØD643E,A3A6
  94Ø DATA ØD7FAØe2Ø2Ca7Cb2Ø3DF1ØØ,C32E
  95Ø DATA Ø7C5aB5D2aB918aBD4Øa94b,13BØ
  96Ø DATA 4ØC2f2Ø9ØØ1C7cB8e4ØbC82,DF1E
  97Ø DATA ØbC96C6572ØD3Ø3731 2Ø333,DCE6
  98Ø DATA 33 12Ø383Ø3Ø3ØØD412Ø3Ø2D,E4AB
  99Ø DATA 392A23ØD,9B38
 1ØØØ DATA *
```

ASSEMBLY LINE

Listing Arm1

```
   1Ø REM     >Basic1
   2Ø REM By  Dave Lawrence
   3Ø REM For 32-bit machines
   4Ø REM (c) BAU April 1993
   5Ø :
   6Ø MODE 12:OFF
   7Ø r=Ø:b=&11
   8Ø FOR col=Ø TO 15
   9Ø COLOUR col,col*r,Ø,col*b
  1ØØ r=&11-r:b=&11-b
  11Ø NEXT
  12Ø PROCsquare(64Ø,512,256,15)
  13Ø END
  14Ø :
  15Ø DEF PROCsquare(x,y,s,c)
  16Ø IF s<4 ENDPROC
  17Ø PROCsquare(x-s,y-s,s/2,c-1)
  18Ø PROCsquare(x+s,y-s,s/2,c-1)
  19Ø PROCsquare(x+s,y+s,s/2,c-1)
  2ØØ PROCsquare(x-s,y+s,s/2,c-1)
  21Ø GCOL 3,c:RECTANGLE FILL x-s,y-s,s*
2,s*2
  22Ø ENDPROC
```

Listing Arm2

```
   1Ø REM     >Basic2
   2Ø REM By  Dave Lawrence
   3Ø REM For 32-bit machines
   4Ø REM (c) BAU April 1993
   5Ø :
   6Ø DIM a(1ØØ)
   7Ø FOR i=1 TO 1ØØ
   8Ø  a(i)=RND(1ØØØØ)
   9Ø NEXT
  1ØØ PROCquick(1,1ØØ)
  11Ø FOR i=1 TO 1ØØ
  12Ø  PRINT,a(i);
  13Ø NEXT
  14Ø END
  15Ø :
  16Ø DEF PROCquick(from,to)
  17Ø a=from-1
  18Ø b=to+1
  19Ø p=a((from+to)/2)
  2ØØ REPEAT
  21Ø  REPEAT
  22Ø   a=a+1
  23Ø  UNTIL a(a)>=p
  24Ø  REPEAT
  25Ø   b=b-1
  26Ø  UNTIL a(b)<=p
  27Ø  IF a<=b SWAP a(a),a(b)
  28Ø UNTIL a>b
  29Ø IF a<to PROCquick(a,to)
  3ØØ IF b>from PROCquick(from,b)
  31Ø ENDPROC
```

Listing Arm3

```
   1Ø REM     >ARM1
   2Ø REM By  Dave Lawrence
   3Ø REM For 32-bit machines
   4Ø REM (c) BAU April 1993
   5Ø :
   6Ø MODE 12:OFF
   7Ø r=Ø:b=&11
   8Ø FOR col=Ø TO 15
   9Ø COLOUR col,col*r,Ø,col*b
  1ØØ r=&11-r:b=&11-b
  11Ø NEXT
  12Ø x=1:y=2:s=3:c=4:s2=5
  13Ø sp=13:link=14:pc=15
  14Ø DIM code 4ØØ
  15Ø FOR pass=Ø TO 2 STEP 2:P%=code
  16Ø [OPT pass
  17Ø .dosquare
  18Ø          STMFD   (sp)!,{link }
  19Ø
  2ØØ          STR     sp,top_sp
  21Ø          BL      square
  22Ø .exit
  23Ø          LDMFD   (sp)!,{pc }
  24Ø
  25Ø .top_sp EQUD     Ø
  26Ø
  27Ø .square
  28Ø          STMFD   (sp)!,{x ,y,s,c,s2,
link}
  29Ø
  3ØØ          CMP     s,#4
  31Ø          BLT     out
  32Ø
  33Ø          MOV     s2,s
  34Ø          MOV     s,s,ASR #1
  35Ø          SUB     c,c,#1
  36Ø
  37Ø          SUB     x,x,s2
  38Ø          SUB     y,y,s2
  39Ø          BL      square
  4ØØ
  41Ø          ADD     x,x,s2,ASL #1
  42Ø          BL      square
  43Ø
  44Ø          ADD     y,y,s2,ASL #1
  45Ø          BL      square
  46Ø
  47Ø          SUB     x,x,s2,ASL #1
  48Ø          BL      square
  49Ø
  5ØØ          LDMIA   (sp),{x ,y,s,c}
  51Ø
  52Ø          SWI     256+18
  53Ø          SWI     256+3
  54Ø          MOV     RØ,c
  55Ø          SWI     "XOS_WriteC"
  56Ø
  57Ø          MOV     RØ,#4
  58Ø          SUB     x,x,s
  59Ø          SUB     y,y,s
  6ØØ          SWI     "XOS_Plot"
  61Ø
  62Ø          MOV     RØ,#97
  63Ø          MOV     R1,s,ASL #1
  64Ø          MOV     R2,s,ASL #1
  65Ø          SWI     "XOS_Plot"
  66Ø
  67Ø          SWI     "XOS_ReadEscapeSta
te"
  68Ø          LDRCS   sp,top_sp
  69Ø          BCS     exit
  7ØØ
  71Ø .out
  72Ø          LDMFD   (sp)!,{x ,y,s,c,s2,
pc}
  73Ø ]NEXT
  74Ø B%=64Ø:C%=512:D%=256:E%=15
  75Ø CALL dosquare
```

Listing Arm4

```
   1Ø REM     >ARM2
   2Ø REM By  Dave Lawrence
   3Ø REM For 32-bit machines
   4Ø REM (c) BAU April 1993
   5Ø :
   6Ø p=5
   7Ø x=6
   8Ø y=7
   9Ø a=8
  1ØØ b=9
  11Ø array=1Ø
  12Ø from=11
  13Ø to=4
  14Ø sp=13:link=14:pc=15
  15Ø DIM code 4ØØ
  16Ø FOR pass=Ø TO 2 STEP 2:P%=code
  17Ø [OPT pass
  18Ø .sort
  19Ø STMFD   (sp)!,{link }
  2ØØ
  21Ø STR     sp,top_sp
  22Ø
  23Ø MOV     array,RØ
  24Ø MOV     from,#1
  25Ø MOV     to,R1
  26Ø BL      quick_sort
  27Ø
  28Ø .exit_sort
  29Ø LDMFD   (sp)!,{pc }
  3ØØ
  31Ø .top_sp EQUD    Ø
  32Ø
  33Ø .quick_sort
  34Ø STMFD   (sp)!,{link }
  35Ø
  36Ø SWI     "XOS_ReadEscapeState"
  37Ø LDRCS   sp,top_sp
  38Ø BCS     exit_sort
  39Ø
  4ØØ ADD     p,from,to
  41Ø MOV     p,p,ASR #1
  42Ø LDR     p,[array,p,ASL #2]
  43Ø SUB     a,from,#1
  44Ø ADD     b,to,#1
  45Ø
  46Ø .qs_loop1
  47Ø ADD     a,a,#1
  48Ø LDR     x,[array,a,ASL #2]
  49Ø CMP     x,p
  5ØØ BLT     qs_loop1
  51Ø
  52Ø .qs_loop2
  53Ø SUB     b,b,#1
  54Ø LDR     y,[array,b,ASL #2]
  55Ø CMP     y,p
  56Ø BGT     qs_loop2
  57Ø
  58Ø CMP     a,b
  59Ø STRLT   x,[array,b,ASL #2]
  6ØØ STRLT   y,[array,a,ASL #2]
  61Ø BLE     qs_loop1
  62Ø
  63Ø STMFD   (sp)!,{b ,from,to}
  64Ø CMP     a,to
  65Ø MOVLT   from,a
  66Ø BLLT    quick_sort
  67Ø
  68Ø LDMFD   (sp)!,{b ,from,to}
  69Ø CMP     b,from
  7ØØ MOVGT   to,b
  71Ø BLGT    quick_sort
  72Ø
  73Ø LDMFD   (sp)!,{pc }
  74Ø
  75Ø ]
  76Ø NEXT
  77Ø numbers=1ØØ
  78Ø DIM block (numbers+1)*4
  79Ø FOR i=1 TO numbers
  8ØØ  block!(i*4)=RND(1ØØØØØ)
  81Ø  PRINT,block!(i*4);
  82Ø NEXT
  83Ø PRINT
  84Ø A%=block
  85Ø B%=numbers
  86Ø PRINT'"Sorting..."
  87Ø CALL sort
  88Ø FOR i=1 TO numbers
  89Ø  PRINT,block!(i*4);
  9ØØ NEXT
  91Ø PRINT
```

Listing Arm5

```
   1Ø REM     >Debug
   2Ø REM By  Dave Lawrence
   3Ø REM For 32-bit machines
   4Ø REM (c) BAU April 1993
   5Ø :
   6Ø DEF PROCassemble_debug
   7Ø PROCdebug_bases
   8Ø [OPT pass
   9Ø .debug
  1ØØ STMFD R13!,{rØ-r12 }
  11Ø BIC R9,R14,#&FØØØØØØ3
  12Ø .debugloop
  13Ø LDRB RØ,[R9],#1
  14Ø CMP RØ,#Ø
  15Ø BEQ debugdone
  16Ø CMP RØ,#128
  17Ø SWILT "OS_WriteC"
  18Ø BLT debugloop
  19Ø AND R8,RØ,#%Ø111ØØØØ
  2ØØ AND RØ,RØ,#%ØØØØ1111
  21Ø LDR RØ,[R13,RØ,LSL #2]
  22Ø ADD PC,PC,R8,LSR #2
  23Ø DCD Ø
  24Ø B typeØØØ
  25Ø B typeØØ1
  26Ø B typeØ1Ø
  27Ø B typeØ11
  28Ø B type1ØØ
  29Ø B type1Ø1
  3ØØ B type11Ø
  31Ø B type111
  32Ø .debugdone
  33Ø MOV R14,R9
  34Ø TST R14,#%11
  35Ø BICNE R14,R14,#%11
  36Ø ADDNE R14,R14,#4
  37Ø LDMFD R13!,{rØ-r12 }
  38Ø MOVS PC,R14
  39Ø :
  4ØØ .typeØ11
  41Ø .type1ØØ
  42Ø .type1Ø1
  43Ø .type11Ø
  44Ø .type111
  45Ø B debugloop
  46Ø :
  47Ø .typeØØØ \ _decimal
  48Ø ADR R1,numbuf
  49Ø MOV R2,#16
  5ØØ SWI "OS_ConvertCardinal4"
  51Ø SWI "OS_WriteØ"
  52Ø B debugloop
  53Ø :
  54Ø .typeØØ1 \ _hex
  55Ø ADR R1,numbuf
  56Ø MOV R2,#16
  57Ø SWI "OS_ConvertHex8"
  58Ø SWI "OS_WriteØ"
  59Ø B debugloop
  6ØØ :
  61Ø .typeØ1Ø \bin8
  62Ø ADR R1,numbuf
  63Ø MOV R2,#16
  64Ø SWI "OS_ConvertBinary1"
  65Ø SWI "OS_WriteØ"
  66Ø B debugloop
  67Ø :
  68Ø .numbuf
  69Ø EQUD Ø:EQUD Ø:EQUD Ø:EQUD Ø
  7ØØ ]
  71Ø ENDPROC
  72Ø
  73Ø DEF PROCdebug_bases
  74Ø _decimal = 128 OR (%ØØØ << 4)
  75Ø _hex     = 128 OR (%ØØ1 << 4)
  76Ø _binary  = 128 OR (%Ø1Ø << 4)
  77Ø ENDPROC
  78Ø :
  79Ø DEF FNdebug(str$)
  8ØØ LOCAL _base,_a,_b,a$
  81Ø PROCdebug_bases
  82Ø [OPT pass
  83Ø BL debug
  84Ø ]
  85Ø WHILE INSTR(str$,"\")>Ø
  86Ø  _a=INSTR(str$,"\")
  87Ø  _b=INSTR(str$,"\",_a+1)-_a-1
  88Ø  a$=MID$(str$,_a+1,_b)
  89Ø  CASE a$ OF
  9ØØ   WHEN "" :str$=LEFT$(str$,_a)+MID
$(str$,_a+2)
```

```
 910   WHEN "n","N" : str$=LEFT$(str$,_
a-1)+CHR$13+CHR$10+MID$(str$,_a+3)
 920   OTHERWISE:
 930    CASE LEFT$(a$,1) OF
 940     WHEN "&"  : _base=_hex    : a$
=MID$(a$,2)
 950     WHEN "%"  : _base=_binary : a$
=MID$(a$,2)
 960     OTHERWISE : _base=_decimal
 970    ENDCASE
 980    str$=LEFT$(str$,_a-1)+CHR$(_bas
e OR EVALa$)+MID$(str$,_a+_b+2)
 990  ENDCASE
1000 ENDWHILE
1010 [OPT pass
1020  EQUS str$
1030  EQUB 0
1040  ALIGN
1050 ]
1060 =""
```

GAMES DESIGNER

Listing GameDes1

```
  10 REM     >AlienEd2
  40 REM (C) BAU April 1993
  90 PROCload_file(0,"Aliens")
 100 PROCload_file(1,"Aliens")
 250 DIM file$(1),type(1),dir$(1)
 260 DIM spr$(max_path-1),com$(max_path
-1)
 271 dir$()="Movement","Sprites"
 490  WHEN 0 : PROCload_data(dir$(n)+".
"+a$)
 500  WHEN 1 : PROCload_sprites(dir$(n)
+"."+a$)
 570 SYS "OS_File",5,dir$(n)+"."+a$ TO
a,,type,,size
 700  IF MID$(line$,27,1)=" " THEN
 710   com$(p)=FNstrip(LEFT$(line$,14))
 711   spr$(p)=FNstrip(MID$(line$,15,13
))
 712   path$=MID$(line$,28)
 713  ELSE
 714   spr$(p)=FNstrip(LEFT$(line$,14))
 715   path$=MID$(line$,15)
 716  ENDIF
1300 PRINTTAB(0,ypos);FNlpad(label$,5);
":";
1490 PRINT FNlpad(spr$,12);
1491 COLOUR 136
1492 COLOUR 9
1493 com$=com$(p)
1494 IF com$="" com$="""""""
1495 PRINTTAB(27,31);FNlpad(com$,12);
1496 COLOUR 128
1501 :
1502 DEF FNlpad(s$,l)
1503 =LEFT$(s$+STRING$(l," "),l)
1770   WHEN x>gridx*g:
1771    IF y<2*g THEN
1772     PROCcomment
1773    ELSE
1774     PROCrepos
1775    ENDIF
2280 out=OPENOUT(dir$(0)+"."+file$)
2340  spr$=FNlpad(spr$(p),12)
2341  com$=com$(p)
2342  IF com$<>"" com$=FNlpad(com$(p),1
2)+" "
2410  PROCbput(out," "+com$+spr$+" "+pa
th$)
2450 SYS "OS_File",18,dir$(0)+"."+file$
,&FFF
4890 VDU 24,gridx*g+4;2*g;1279;gridy*g;
16
5511 :
5512 DEF PROCcomment
5513 COLOUR 136:COLOUR 9
5514 IF com$(path)="" VDU 31,27,31,32,3
2
5515 com$(path)=FNalter(com$(path),27,3
1,12)
5516 ENDPROC
```

Listing GameDes2

```
  10 REM     >Populate
  20 REM By  Antony Bruce Lytis
  30 REM For 32-bit machines
  40 REM (C) BAU April 1993
  50 :
  60 MODE 9:OFF
  70 PROCinit
  80 PROCinit_sblk
  90 PROCclear_map
 100 PROCclear_pos
 110 PROCload
 120 PROCedit
 130 END
 140 :
 150 DEF PROCinit
 160 size=16
 170 pixlen=16384
 180 maxwid=256 DIV 16
 190 maxlen=pixlen DIV size
 200 xsize=320 DIV size
 210 ysize=256 DIV size
 220 sqr=size*4
 230 max_move=256
 240 DIM sprname$(256),map maxwid*maxle
n,blk 20
 250 DIM used(256),pos pixlen*4,pused(m
ax_move)
 260 DIM move$(max_move),mspr(max_move)
,pat$(max_move),spr(max_move)
 270 game$="Test"
 280 games$="Games"
 290 top=ysize-2
 300 xpos=0
 310 spop=FNswi("XOS_SpriteOp")
 320 pat=0
 330 null$=CHR$13
 340 sel=-1
 350 spc12$=STRING$(12," ")
 360 ENDPROC
 370 :
 380 DEF FNswi(swi$)
 390 SYS "OS_SWINumberFromString",,swi$
 TO swi
 400 =swi
 410 :
 420 DEF PROCinit_sblk
 430 sbsize=HIMEM-END-32768
 440 DIM sblk sbsize
 450 !sblk=sbsize
 460 sblk!8=16
 470 SYS spop,&109,sblk
 480 ENDPROC
 490 :
 500 DEF PROCclear_sprites
 510 SYS spop,&109,sblk
 520 ENDPROC
 530 :
 540 DEF PROCload_sprites(file$)
 550 SYS spop,&10B,sblk,file$
 560 ENDPROC
 570 :
 580 DEF PROCsprite_names
 590 FOR s=0 TO sprites-1
 600  sprname$(s)=FNsprite_name(s+1)
 610 NEXT
 620 ENDPROC
 630 :
 640 DEF FNnoof_sprites
 650 SYS spop,&108,sblk TO ,,,number
 660 =number
 670 :
 680 DEF FNsprite_name(spr)
 690 SYS spop,&10D,sblk,blk,20,spr TO ,
,,nlen
 700 blk?nlen=13
 710 =$blk
 720 :
 730 DEF FNmatch_sprname(spr$)
 740 i=1
 750 matched=FALSE
 760 spr$=FNlo(spr$)
 770 WHILE NOT matched
 780  SYS spop,&10D,sblk,blk,20,i TO ,,
,nlen;ok
 790  IF (ok AND 1)>0 THEN
 800   matched=TRUE
 810  ELSE
 820   blk?nlen=13
 830   IF LEFT$($blk,LEN(spr$))=spr$ TH
EN
 840    matched=TRUE
 850    spr$=$blk
 860   ELSE
 870    i+=1
 880   ENDIF
 890  ENDIF
 900 ENDWHILE
 910 =spr$
 920 :
 930 DEF FNaddress_of(spr$)
 940 SYS spop,&118,sblk,spr$ TO ,,addr
;v
 950 IF v AND 1 addr=0
 960 =addr
 970 :
 980 DEF PROCclear_map
 990 FOR i=0 TO maxwid*maxlen-1 STEP 4
1000  map!i=0
1010 NEXT
1020 ENDPROC
1030 :
1040 DEF PROCclear_pos
1050 FOR i=0 TO pixlen*4 STEP 4
1060  pos!i=-1
1070 NEXT
1080 ENDPROC
1090 :
1100 DEF FNstrip(a$)
1110 WHILE LEFT$(a$,1)=" "
1120  a$=MID$(a$,2)
1130 ENDWHILE
1140 WHILE RIGHT$(a$,1)=" "
1150  a$=LEFT$(a$)
1160 ENDWHILE
1170 =a$
1180 :
1190 DEF FNfind_sprite(spr$)
1200 spr=sprites
1210 REPEAT
1220  spr-=1
1230 UNTIL spr=0 OR spr$=sprname$(spr)
1240 IF spr$=sprname$(spr) THEN =spr
1250 ERROR 1,"Unknown sprite '"+spr$+"'
"
1260 :
1270 DEF FNlo(a$)
1280 b$=""
1290 FOR lo=1 TO LENa$
1300  c$=MID$(a$,lo,1)
1310  IF c$>="A" AND c$<="Z" c$=CHR$(AS
Cc$+32)
1320  b$+=c$
1330 NEXT
1340 =b$
1350 :
1360 DEF FNinput(old$,x,y,max)
1370 VDU 31,x+LENold$,y
1380 a$=old$
1390 MOUSE ix,iy,iz
1400 iheld=(iz>0)
1410 *FX229,1
1420 *FX21,0
1430 ON
1440 REPEAT
1450  REPEAT
1460   key=INKEY0
1470   MOUSE x,y,z
1480   IF z=0 iheld=FALSE
1490  UNTIL key<>-1 OR (z<>0 AND NOT ih
eld)
1500  IF z<>0 key=13
1510  IF key=127 AND LENa$>0 VDU 127:a$
=LEFT$(a$)
1520  IF key=21 OR key=27 PRINTSTRING$(
LENa$,CHR$127);:a$=""
1530  IF key=27 a$=old$:PRINTa$;
1540  IF key>32 AND key<127 AND LENa$<m
ax a$+=CHR$key:VDU key
1550 UNTIL key=13 OR key=27
1560 IF key=27 a$=""
1570 OFF
1580 *FX229,0
1590 =a$
1600 :
1610 DEF FNlength
1620 w=maxlen
1630 REPEAT
1640  w-=1
1650 UNTIL w=0 OR FNnot_blank(w)
1660 =w+1
1670 :
1680 DEF FNnot_blank(c)
1690 nb=-4
1700 REPEAT
1710  nb+=4
1720 UNTIL nb>top OR map!(c*maxwid+nb)<
>0
1730 =(map!(c*maxwid+nb)<>0)
1740 :
1750 DEF PROCfind_used
1760 used()=-1
1770 used(0)=0
1780 next=1
1790 FOR i=0 TO length-1
1800  FOR j=0 TO across-1
1810   k=map?(i*maxwid+j)
1820   IF used(k)<0 used(k)=next:next+=
1
1830  NEXT
1840 NEXT
1850 ENDPROC
1860 :
1870 DEF PROCload
1880 VDU 30:SYS "OS_CLI","Cat "+games$
1890 ok=FALSE
1900 REPEAT
1910  PRINTTAB(0,20);"Load game:";game$
1920  new$=FNinput(game$,10,20,12)
1930  IF new$<>"" THEN
1940   IF FNok(games$+"."+new$) THEN
1950    game$=new$
1960    PROCgame(games$+"."+game$)
1970    ok=TRUE
1980   ENDIF
1990  ENDIF
2000 UNTIL ok
2010 ENDPROC
2020 :
2030 DEF PROCgame(g$)
2040 game=OPENIN(g$)
2050 REPEAT
2060  in$=FNstrip(GET$#game)
2070 UNTIL LEFT$(in$,1)<>";" AND in$<>"
"
2080 FOR line=1 TO 6
2090  colon=INSTR(in$,":")
2100  type$=FNlo(LEFT$(in$,colon-1))
2110  file$=FNstrip(MID$(in$,colon+1))
2120  IFEVAL("FNload_"+type$+"("""+file
$+""")")
2130  in$=FNstrip(GET$#game)
2140 NEXT
2150 CLOSE #game
2160 ENDPROC
2170 :
2180 DEF FNload_scenery(f$)
2190 PROCclear_sprites
2200 PROCload_sprites("Scenery."+f$)
2210 sprites=FNnoof_sprites
2220 PROCsprite_names
2230 =0
2240 :
2250 DEF FNload_maps(f$)
2260 in=OPENIN("Maps."+f$)
2270 mode$=""
2280 REPEAT
2290  REPEAT
2300   in$=FNstrip(GET$#in)
2310  UNTIL EOF#in OR (LEFT$(in$,1)<>";
" AND in$<>"")
2320  IF in$<>"" THEN
2330   IF RIGHT$(in$,1)=":" THEN
2340    mode$=in$
2350    CASE mode$ OF
2360     WHEN "Used:":
2370      used()=-1
2380     WHEN "Map:"
2390      store=map
2400      maplen=0
2410    ENDCASE
2420   ELSE
2430    CASE mode$ OF
2440     WHEN "Used:"
2450      spc=INSTR(in$," ")
2460      spr=EVAL("&"+LEFT$(in$,2))
2470      used(spr)=FNfind_sprite(FNlo(
MID$(in$,spc+1)))
2480     WHEN "Map:"
2490      IF INSTR(in$,"-")=0 in$+="-"
2500      i=0
2510      WHILE LEFT$(in$,1)<>"-"
2520       store?i=used(EVAL("&"+LEFT$(
in$,2)))
2530       i+=1
2540       in$=MID$(in$,3)
2550      ENDWHILE
2560      in$=MID$(in$,2)
2570      i=top
2580      WHILE in$<>""
2590       store?i=used(EVAL("&"+RIGHT$
(in$,2)))
2600       i-=1
2610       in$=LEFT$(in$,LENin$-2)
2620      ENDWHILE
2630      store+=maxwid
2640      maplen+=1
2650    ENDCASE
2660   ENDIF
2670  ENDIF
2680 UNTIL EOF#in
2690 CLOSE #in
2700 lastcol=(maplen-xsize)*sqr
2710 SYS spop,&128,sblk,"blank" TO ,,,,
,,mode
2720 IF mode<>9 ERROR 1,"Not Mode 9"
2730 SYS spop,&118,sblk,"palette" TO ,,
pal_spr
2740 pal_dat=pal_spr+44
2750 FOR i=0 TO 15
2760  a=pal_dat+8*i
2770  COLOUR i,a?1,a?2,a?3
2780 NEXT
2790 =0
2800 :
2810 DEF FNok(f$)
2820 SYS "OS_File",5,f$ TO type
2830 =(type=1)
2840 :
2850 DEF FNload_sprites(f$)
2860 PROCload_sprites("Sprites."+f$)
2870 =0
2880 :
2890 DEF FNload_movement(f$)
2900 in=OPENIN("Movement."+f$)
2910 moves=0
2920 WHILE NOT EOF#in
2930  in$=GET$#in
2940  IF in$<>"" AND LEFT$(in$,1)<>";"
THEN
2950   IF MID$(in$,27,1)=" " THEN
2960    move$=FNstrip(MID$(in$,2,12))
2970    spr$=FNstrip(MID$(in$,15,12))
2980    spr$=FNmatch_sprname(spr$)
2990    addr=FNaddress_of(spr$)
3000    IF addr>0 THEN
3010     move$(moves)=FNlo(move$)
3020     mspr(moves)=addr
3030     moves+=1
3040    ENDIF
3050   ENDIF
3060  ENDIF
3070 ENDWHILE
3080 CLOSE #in
3090 =0
3100 :
3110 DEF FNload_patterns(f$)
3120 in=OPENIN("Patterns."+f$)
3130 pats=0
3140 WHILE NOT EOF#in
3150  in$=GET$#in
3160  IF in$<>"" AND LEFT$(in$,1)<>";"
THEN
3170   IF LEFT$(in$,1)<>" " THEN
3180    spc=INSTR(in$," ")
3190    pat$=LEFT$(in$,spc-1)
3200    rest$=FNstrip(MID$(in$,spc))
3210    i=0
3220    REPEAT
3230     i+=1
3240    UNTIL i>LENrest$ OR MID$(rest$,
i,1)=" "
3250    move$=FNlo(LEFT$(rest$,i-1))
3260    move=FNfind(move$,move$())
3270    IF move<>-1 THEN
3280     pat$(pats)=pat$
3290     spr(pats)=mspr(move)
3300     pats+=1
3310    ENDIF
3320   ENDIF
3330  ENDIF
3340 ENDWHILE
3350 CLOSE #in
3360 =0
3370 :
3380 DEF FNfind(a$,a$())
3390 LOCAL i,got
3400 i=DIM(a$(),1)+1
3410 REPEAT
3420  i-=1
3430 UNTIL a$=a$(i) OR i=0
3440 IF a$=a$(i) THEN =i
3450 =-1
3460 :
3470 DEF FNload_layout(f$)
3480 in=OPENIN("Layout."+f$)
3490 IF in<>0 THEN
3500  found=FALSE
3510  WHILE NOT EOF#in
3520   in$=FNstrip(GET$#in)
3530   IF in$<>"" AND LEFT$(in$,1)<>";"
 THEN
3540    IF NOT found THEN
3550     IF in$="Layout:" found=TRUE
3560    ELSE
3570     pat=FNeval(in$)
3580     abs=FNeval(in$)
3590     mem=pos+abs*4
```

```
 3600     mem?Ø=pat
 3610     mem?1=FNeval(in$)
 3620     mem?2=-1
 3630     mem?3=-1
 3640     IF in$<>"" mem?2=FNeval(in$) D
IV 2
 3650     IF in$<>"" mem?3=FNeval(in$) D
IV 2
 3660    ENDIF
 3670   ENDIF
 3680  ENDWHILE
 3690  CLOSE #in
 3700 ENDIF
 3710 layout$=f$
 3720 =Ø
 3730 :
 3740 DEF FNeval(RETURN a$)
 3750 spc=INSTR(a$," ")
 3760 a=EVALa$
 3770 IF spc=Ø a$="" ELSE a$=FNstrip(MID
$(a$,spc+1))
 3780 =a
 3790 :
 3800 DEF PROCscreen
 3810 FOR col=Ø TO xsize-1
 3820  PROCcolumn(col+xpos DIV sqr,col*s
qr)
 3830 NEXT
 3840 PROCaliens(xpos DIV sqr,(xpos DIV
sqr)+xsize-1)
 3850 ENDPROC
 3860 :
 3870 DEF PROCcolumn(column,at)
 3880 addr=map+column*maxwid
 3890 FOR i=Ø TO top
 3900  SYS spop,&122,sblk,sprname$(addr?
i),at,(i+1)*sqr
 3910 NEXT
 3920 ENDPROC
 3930 :
 3940 DEF PROCpoke(px,py,poke)
 3950 map?(px*xm+py*ym)=poke
 3960 ENDPROC
 3970 :
 3980 DEF PROCpathname(p)
 3990 PRINTTAB(1,31);CHR$136;" ";FNlpad(
pat$(p),12);" ";CHR$137;
 4000 ENDPROC
 4010 :
 4020 DEF PROClayoutname
 4030 PRINTTAB(21,31);"File: ";FNlpad(la
yout$,12);
 4040 ENDPROC
 4050 :
 4060 DEF FNlpad(s$,l)
 4070 =LEFT$(s$+STRING$(l," "),l)
 4080 :
 4090 DEF FNrpad(s$,r)
 4100 =RIGHT$(STRING$(r," ")+s$,r)
 4110 :
 4120 DEF PROCedit
 4130 PROCscreen
 4140 PROCpathname(pat)
 4150 PROClayoutname
 4160 MOUSE ON
 4170 held=FALSE
 4180 REPEAT
 4190  MOUSE x,y,z
 4200  IF z=Ø THEN
 4210   PROCflash(sel,Ø)
 4220   move=FNmouse(2Ø)
 4230   PROCflash(sel,1)
 4240   IF NOT move wait=FNmouse(2Ø)
 4250  ENDIF
 4260  IF z=Ø THEN
 4270   held=FALSE
 4280  ELSE
 4290   IF held z=Ø ELSE held=TRUE
 4300  ENDIF
 4310  IF y>sqr THEN
 4320   CASE z OF
 4330    WHEN Ø:
 4340     IF x>1279-4 PROClscroll
 4350     IF x<4 PROCrscroll
 4360    WHEN 2:
 4370     IF sel=-1 THEN
 4380      PROCplace
 4390     ELSE
 4400      IF FNwhat_at(x,y)=sel THEN
 4410       PROCrespot
 4420      ELSE
 4430       PROCplace
 4440      ENDIF
 4450     ENDIF
 4460    WHEN 4:
 4470     IF INKEY-1 THEN
 4480      PROCdelete
 4490     ELSE
 4500      PROCselect
 4510     ENDIF
 4520    WHEN 1:PROCdeselect
 4530   ENDCASE
 4540  ELSE
 4550   x=x DIV 32
 4560   y=31-(y DIV 32)
 4570   IF z>Ø THEN
 4580    IF y=31 THEN
 4590     IF x=1 PROCnewpath(-1)
 4600     IF x=16 PROCnewpath(1)
 4610     IF x=18 OR x=19 AND sel<>-1 PR
OCadjust_status(sel)
 4620     IF x>2Ø PROCsave
 4630    ENDIF
 4640   ENDIF
 4650  ENDIF
 4660 UNTIL FALSE
 4670 ENDPROC
 4680 :
 4690 DEF PROCadjust_status(at)
 4700 col=at-xpos DIV 4
 4710 IF col>32Ø col=32Ø
 4720 IF col<Ø VDU 7:ENDPROC
 4730 IF INKEY-1 THEN
 4740  mem?2=-1
 4750  mem?3=-1
 4760 ELSE
 4770  IF mem?2=255 THEN
 4780   mem?2=col DIV 2
 4790  ELSE
 4800   IF z=4 mem?2=col DIV 2
 4810   IF z=1 mem?3=col DIV 2
 4820  ENDIF
 4830  IF mem?2<>255 AND mem?3<>255 AND
mem?2<mem?3 SWAP mem?2,mem?3
 4840 ENDIF
 4850 PRINTTAB(18,31);FNstatus(at);
 4860 ENDPROC
 4870 :
 4880 DEF FNstatus(at)
 4890 IF at=-1 THEN ="  "
 4900 mem=pos+4*at
 4910 col=at-xpos DIV 4
 4920 IF mem?2=255       THEN ="-"
 4930 IF col DIV 2>mem?2 THEN ="<<"
 4940 IF mem?3=255       THEN ="G1"
 4950 IF col DIV 2<mem?3 THEN ="G2"
 4960 ="??"
 4970 :
 4980 DEF PROCflash(at,state)
 4990 IF at=-1 OR pos!(at*4)=-1 ENDPROC
 5000 mem=pos+4*at
 5010 fx=4*at-xpos
 5020 fy=4*mem?1+sqr
 5030 CASE state OF
 5040  WHEN Ø:
 5050   GCOL 128
 5060   SYS spop,&231,sblk,spr(?mem),fx,
fy
 5070  WHEN 1:
 5080   SYS spop,&222,sblk,spr(?mem),fx,
fy,8
 5090 ENDCASE
 5100 ENDPROC
 5110 :
 5120 DEF FNmouse(wait)
 5130 time=TIME
 5140 xx=x:yy=y
 5150 REPEAT
 5160  MOUSE x,y,z
 5170  PRINTTAB(1,3Ø);FNid(x,y);
 5180  move=(z>Ø OR x<4 OR x>1279-4)
 5190  IF z=Ø held=FALSE
 5200 UNTIL TIME>time+wait OR move
 5210 =move
 5220 :
 5230 DEF FNid(x,y)
 5240 IF NOT INKEY-2 THEN =spc12$+spc12$
 5250 id=FNwhat_at(x,y)
 5260 IF id=-1 THEN ="[ "+spc12$+"   ..
]"
 5270 ="[ "+FNlpad(pat$(pos?(4*id)),12)+
"   "+FNstatus(id)+" ]"
 5280 :
 5290 DEF PROCnewpath(a)
 5300 pat=(pat+pats+a)MODpats
 5310 PROCpathname(pat)
 5320 ENDPROC
 5330 :
 5340 DEF PROCpointer(px,py)
 5350 blk!1=px
 5360 blk!3=py
 5370 ?blk=5:SYS "OS_Word",21,blk
 5380 ENDPROC
 5390 :
 5400 DEF PROClscroll
 5410 *FX 106,&81
 5420 MOUSE RECTANGLE -1ØØØ,-1ØØØ,2ØØØ,2
ØØØ
 5430 MOUSE TO Ø,Ø
 5440 ox=Ø:xs=Ø
 5450 REPEAT
 5460  dx=xs-ox
 5470  ox=xs
 5480  MOUSE xs,ys,zs
 5490  PROCpointer(x,y+ys)
 5500  xs=(xs AND NOT 7) DIV 2
 5510  IF xs>Ø THEN
 5520   IF xpos+xs>lastcol scroll=lastco
l-xpos ELSE scroll=xs
 5530   IF scroll<>Ø THEN
 5540    RECTANGLE FILL Ø,sqr,1279,1Ø23-
sqr TO -scroll,sqr
 5550    PRINTTAB(18,31);FNstatus(sel);
 5560    x1=(xpos DIV sqr)+xsize
 5570    xp=128Ø-scroll-(xpos MOD sqr)
 5580    xØ=x1
 5590    REPEAT
 5600     PROCcolumn(x1,xp)
 5610     xp+=sqr
 5620     x1+=1
 5630    UNTIL xp>128Ø
 5640    xpos+=scroll
 5650    PROCaliens(xØ,x1-1)
 5660   ENDIF
 5670  ENDIF
 5680 UNTIL dx<Ø
 5690 MOUSE RECTANGLE Ø,Ø,1279,1Ø23
 5700 MOUSE TO x+dx,y+ys
 5710 *FX 106,1
 5720 ENDPROC
 5730 :
 5740 DEF PROCrscroll
 5750 *FX 106,&81
 5760 MOUSE RECTANGLE -1ØØØ,-1ØØØ,2ØØØ,2
ØØØ
 5770 MOUSE TO Ø,Ø
 5780 ox=Ø:xs=Ø
 5790 REPEAT
 5800  dx=xs-ox
 5810  ox=xs
 5820  MOUSE xs,ys,zs
 5830  PROCpointer(x,y+ys)
 5840  xs=(xs AND NOT 7) DIV 2
 5850  IF xs<Ø THEN
 5860   IF -xs>xpos scroll=-xpos ELSE sc
roll=xs
 5870   IF scroll<>Ø THEN
 5880    RECTANGLE FILL Ø,sqr,1279,1Ø23-
sqr TO -scroll,sqr
 5890    PRINTTAB(18,31);FNstatus(sel);
 5900    x1=(xpos DIV sqr)
 5910    xp=-scroll-(xpos MOD sqr)
 5920    xØ=x1
 5930    REPEAT
 5940     PROCcolumn(x1,xp)
 5950     xp-=sqr
 5960     x1-=1
 5970    UNTIL xp<Ø
 5980    xpos+=scroll
 5990    PROCaliens(x1+1,xØ)
 6000   ENDIF
 6010  ENDIF
 6020 UNTIL dx>Ø
 6030 MOUSE RECTANGLE Ø,Ø,1279,1Ø23
 6040 MOUSE TO x+dx,y+ys
 6050 *FX 106,1
 6060 ENDPROC
 6070 :
 6080 DEF PROCaliens(c1,c2)
 6090 a1=(c1-1)*size:IF a1<Ø a1=Ø
 6100 a2=(c2+1)*size:IF a2>=lastcol a2=l
astcol-1
 6110 FOR abs=a1*4 TO a2*4 STEP 4
 6120  IF pos!abs<>-1 SYS spop,&222,sblk
,spr(pos?abs),abs-xpos,sqr+4*pos?(abs+1)
,8
 6130 NEXT
 6140 ENDPROC
 6150 :
 6160 DEF PROCshow(spr,x,y,w,h)
 6170 SYS spop,&11Ø,sblk,null$,,x,y,x+w*
4,y+h*4
 6180 SYS spop,&222,sblk,spr,x,y,8
 6190 ENDPROC
 6200 :
 6210 DEF PROCrespot
 6220 mem=pos+4*sel
 6230 spr=?mem
 6240 old=!mem
 6250 xoff=4*sel-xpos-x
 6260 yoff=4*mem?1+sqr-y
 6270 PROCremove(sel)
 6280 new=FNmove(spr,xoff,yoff)
 6290 IF new>Ø THEN
 6300  sel=new
 6310  PRINTTAB(18,31);FNstatus(sel);
 6320 ELSE
 6330  !mem=old
 6340  SYS spop,&222,sblk,spr(?mem),sel*
4-xpos,sqr+4*mem?1,8
 6350 ENDIF
 6360 ENDPROC
 6370 :
 6380 DEF PROCplace
 6390 dummy=FNmove(pat,Ø,Ø)
 6400 ENDPROC
 6410 :
 6420 DEF FNmove(p,dx,dy)
 6430 LOCAL held
 6440 SYS spop,&228,sblk,spr(p) TO ,,,w,
h
 6450 x+=dx:y+=dy
 6460 PROCshow(spr(p),x,y,w,h)
 6470 ox=x:oy=y
 6480 to=-1
 6490 MOUSE OFF
 6500 REPEAT
 6510  held=TRUE
 6520  REPEAT
 6530   MOUSE x,y,z
 6540   x+=dx
 6550   y+=dy
 6560   IF x<>ox OR y<>oy THEN
 6570    IF y>=sqr THEN
 6580     WAIT
 6590     SYS spop,&122,sblk,null$,ox,oy
 6600     PROCshow(spr(p),x,y,w,h)
 6610     ox=x:oy=y
 6620    ENDIF
 6630   ENDIF
 6640   IF z=Ø held=FALSE
 6650  UNTIL (z>Ø AND NOT held) OR y<sqr
 6660  IF y>=sqr THEN
 6670   to=(xpos+x) DIV 4
 6680   abs=pos+4*to
 6690   IF !abs=-1 THEN
 6700    ?abs=p
 6710    abs?1=(y-sqr) DIV 4
 6720    abs?2=-1
 6730    abs?3=-1
 6740   ELSE
 6750    VDU 7
 6760    to=-1
 6770   ENDIF
 6780  ELSE
 6790   SYS spop,&122,sblk,null$,ox,oy
 6800   to=-2
 6810  ENDIF
 6820 UNTIL to<>-1
 6830 MOUSE ON
 6840 =to
 6850 :
 6860 DEF PROCsave
 6870 MOUSE OFF
 6880 new$=FNinput(layout$,27,31,12)
 6890 IF new$<>"" THEN
 6900  IF new$<>layout$ THEN
 6910   full$=games$+"."+game$
 6920   out=OPENOUT"_x_"
 6930   in=OPENIN(full$)
 6940   WHILE NOT EOF#in
 6950    in$=GET$#in
 6960    IF LEFT$(in$,7)="Layout:" THEN
 6970     at=LENin$
 6980     WHILE MID$(in$,at,1)<>" "
 6990      at-=1
 7000     ENDWHILE
 7010     in$=LEFT$(in$,at)+new$
 7020    ENDIF
 7030    PROCbput(out,in$)
 7040   ENDWHILE
 7050   CLOSE #in
 7060   CLOSE #out
 7070   layout$=new$
 7080   SYS "OS_CLI","Wipe "+full$+" F~C
~V"
 7090   SYS "OS_CLI","Rename _x_ "+full$
 7100   PROCset_type(full$,&FFF)
 7110  ENDIF
 7120  pused()=FALSE
 7130  FOR i=Ø TO lastcol-1
 7140   IF pos!(i*4)<>-1 pused(pos?(i*4)
)=TRUE
 7150  NEXT
 7160  out=OPENOUT("Layout."+layout$)
 7170  PROCbput(out,"; >Layout."+layout$
)
 7180  PROCbput(out,"; "+TIME$)
 7190  PROCbput(out,"")
 7200  PROCbput(out,"Patterns:")
 7210  FOR i=Ø TO max_move
 7220   IF pused(i) PROCbput(out," "+FNl
pad(pat$(i),13)+STR$i)
 7230  NEXT
 7240  PROCbput(out,"")
 7250  PROCbput(out,"Layout:")
 7260  FOR i=Ø TO lastcol-1
 7270   IF pos!(i*4)<>-1 THEN
 7280    mem=pos+i*4
 7290    out$=" "+FNrpad(STR$?mem,3)+" "
+FNrpad(STR$i,5)+" "+FNrpad(STR$mem?1,3)
 7300    IF mem?2<>255 out$+=" "+FNrpad(
STR$(mem?2*2),3)
 7310    IF mem?3<>255 out$+=" "+FNrpad(
STR$(mem?3*2),3)
 7320    PROCbput(out,out$)
 7330   ENDIF
 7340  NEXT
 7350  CLOSE #out
 7360  PROCset_type("Layout."+layout$,&F
FF)
 7370  PROClayoutname
 7380 ENDIF
 7390 MOUSE ON
 7400 ENDPROC
 7410 :
 7420 DEF PROCset_type(f$,type)
 7430 SYS "OS_File",18,f$,type
 7440 ENDPROC
 7450 :
 7460 DEF PROCbput(f,s$)
 7470 BPUT #f,s$+CHR$1Ø;
 7480 ENDPROC
 7490 :
 7500 DEF PROCselect
 7510 new=FNwhat_at(x,y)
 7520 IF new<>-1 THEN
 7530  sel=new
 7540  PRINTTAB(18,31);FNstatus(sel);
 7550 ENDIF
 7560 ENDPROC
 7570 :
 7580 DEF FNwhat_at(xat,yat)
 7590 xat=(xat+xpos) DIV 4
 7600 yat=(yat-sqr) DIV 4
 7610 add=1
 7620 end=Ø
 7630 try=xat
 7640 REPEAT
 7650  IF try>=Ø AND try<lastcol THEN
 7660   IF FNon(xat,yat,try) end=1
 7670  ENDIF
 7680  IF end=Ø THEN
 7690   try+=add
 7700   add=-add-SGNadd
 7710   IF ABSadd>2*sqr end=-1
 7720  ENDIF
 7730 UNTIL end<>Ø
 7740 IF end=1 THEN =try
 7750 =-1
 7760 :
 7770 DEF PROCdelete
 7780 del=FNwhat_at(x,y)
 7790 IF del<>-1 THEN
 7800  PROCremove(del)
 7810  IF sel=del sel=-1
 7820  PRINTTAB(18,31);FNstatus(sel);
 7830 ENDIF
 7840 ENDPROC
 7850 :
 7860 DEF PROCremove(s)
 7870 mem=pos+s*4
 7880 SYS spop,&228,sblk,spr(?mem) TO ,,
,w
 7890 c1=s DIV size
 7900 c2=(s+w) DIV size
 7910 FOR col=c1 TO c2
 7920  PROCcolumn(col,col*sqr-xpos)
 7930 NEXT
 7940 !mem=-1
 7950 PROCaliens(c1,c2)
 7960 ENDPROC
 7970 :
 7980 DEF FNon(sx,sy,s)
 7990 IF pos!(s*4)=-1 THEN =FALSE
 8000 mem=pos+s*4
 8010 SYS spop,&228,sblk,spr(?mem) TO ,,
,w,h
 8020 =(sx>=s AND sx<s+w AND sy>=mem?1 A
ND sy<mem?1+h)
 8030 :
 8040 DEF PROCdeselect
 8050 sel=-1
 8060 PRINTTAB(18,31);FNstatus(-1);
 8070 ENDPROC
```

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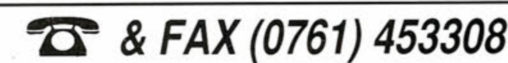
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● Master 512, colour monitor, Viglen case, 5.25in disc drive, mouse, joystick, Teletext, Gem, View, Spellcheck, Educational, games, books, manuals, mags – £375. Contact Mr R Smart, Surrey. Tel: 081-393 2296

● Master 128, colour monitor twin 40/ 80 double sided disc drive, Taxan printer, Spellmaster, Viewstore, Amx, mouse Superart etc, other software, manuals – £450. Contact Keeling, Leicester. Tel: (0533) 864665

● A3000, Philips monitor, printer, Emulator, 1st Word Plus, Home Accounts, magazines – £525, selection of 20 games including Lemmings, Elite – £100. Contact J Cunningham, Letchworth. Tel: (0462) 678 566

● Wanted urgently: Watford 30Mb Winchester, also Shibumi Problem Solver, good PC software. Contact Mr C Game, Essex. Tel: (0621) 815162 anytime

● A3000, upgraded (2mb), Philips colour monitor, Spreadsheet, word processor – £625 ono. Contact R John, West Glamorgan. Tel: (0639) 642954

● A3000, colour, 2Mb serial, Impression II, Pipedream, PC Emulator, Euclid etc, games, lots of PD software – £650. Contact Mr R Rainthorpe, Lincoln. Tel: (0673) 885293

● BBC B, disc drive, monitor, Wordwise word processor, Spellmaster Rom and printer – £300. Contact Mr Fitzgerald, Middlesex. Tel: 081-941 2853

● A3000, Learning Curve, Philips colour monitor, Citizen Swift printer – £600. Contact Mr A Williams, Gwynedd. Tel: (0286) 830890 eve

● Unwanted PC emulator, single and multitasking 1.8 version, all discs and manuals, offers or swap for joystick interface (A3000) and joysticks. Contact Mr T Morrison, Lincoln. Tel: (0522) 723266

● BBC B Issue 7, Opus Challenger 526k, double sided disc drive, Morley teletext, double plinth, mouse, Watford sideways Rom/Ram tapes, discs, Roms, books, bargain – £260. Contact Mr N Love, Newbury. Tel: (0635) 34891

● BBC B, Watford DFS, disc drive, colour monitor, ATPL Rom board with View, Amx, Superart, assorted games and books – £250 ono. Contact Mr R Lucas, Berkshire. Tel: (0734) 303117

● A5000, 40Mb hard disc and compression, Acorn monitor – £1000 ono, BBC Laser Vision Rom player – £80. Contact H Bowman, Surrey. Tel: 081-948 1540

● Master 512k, two 40/80 track disc drives, joystick, tape deck and manuals, over 50 software packages, 9 pin NLQ printer, a bargain – £500 ono. Contact Mr O Digby, Canterbury. Tel: (0227) 766289

● Star NL10 printer – £85. Contact Mr S Alg, London SW15. Tel: 081-811 9398

● Archimedes 410/1, 50Mb hard drive, 4Mb Ram, Taxan 770+ low resolution multisync monitor, PC Emulator, second drive interface, games – £1100. Contact Mr J Phipps, Kent. Tel: (0634) 235450 evenings

● A3000, stereo monitor, 4Mb Ram, 20Mb hard drive, serial upgrade, original boxes, manuals, discs, tuition – £800 ono. Contact Mr P Rawson, Northumberland. Tel: (0434) 685361 daytime, 685387 evenings

● A3000, 4Mb, serial upgrade, Acorn colou monitor and stand, Wildvision, three-podule expansion case, all boxed with manuals – £650. Contact Mr G Rhodes, Doncaster. Tel: (0302) 722781

● BBC B with Acorn tape drive, over 40 games and other tapes, also books – £140. Contact Mr J Dobson, Coventry. Tel: (0203) 457244

● Master Turbo, Microvitec 1451 monitor, dual 40/80 drives, plus extra manuals, Roms and programs – £400. Contact M Robertson, Aylesbury. Tel: (0296) 23124

● BBC B, colour monitor, 80 track double disc drive, Epson pinter, View, games, leads, manuals, covers – £240. Contact D Berry, London N2. Tel: 081-455 8788

● A5000, 4Mb Ram, 40Mb internal hard drive, Acorn SCSI card (including CDFS), Acorn multisync monitor and all manuals, excellent condition – only £1195. Contact Mr A Nelson, Surrey. Tel: (0252) 737630 office hours

● BBC keyboard – £25 ono, Microvitec 1431 monitor, very good condition – £125 ono. Contact C Hodgson, Cheshire. Tel: 051-424 1957

● Wanted: Plus 1 and Plus 3 suitable for Acorn Electron, all must work. Contact Mr S Reid, Nottingham. Tel: (0602) 226478

● Master 128k, 40/80 disc drive, View, Viewsheet, Amx Superart and mouse, manuals, software – £150 ono. Contact C Hayman, Surrey. Tel: (0483) 284253 ISO Pascal Rom cartridge for Electron – £25, Sanyo colour monitor for BBC/ Electron – £30. Contact Mr S Roberts, Essex. Tel: (0277) 353769

● Wanted: Heritage program for BBC. Contact W Shepherd, Lincs. Tel: (0507) 578 612

● A3000, Acorn colour monitor, original manuals and application discs, Panasonic KXP1081 – £700. Contact Mr J Flaherty, Herts. Tel: (0992) 468521

● Microvitec cub 1441 high resolution colour monitor, practically unused, boxed – £135. Contact Mr J Connelly, Hitchin. Tel: (0462) 712061

● M1009 Brother dot matrix printer, instruction manuals – £55. Contact W Parrott, Berks. Tel: (0734) 734071

● Acorn CV4, Assembler V2, PC Emulator V1.8, Beebug C Development, all manuals, all perfect, all cheap. Contact L Lewis, Gwent. Tel: (0873) 853538

● BBC B, Challenger Ram, 5.25in disc drives, 32k Shadow and 128k Rom/ Ram boards, mouse, Roms etc – £150. Contact J Marshall, Leeds. Tel: (0532) 755756

● A3000, 2Mb, Acorn colour monitor, 5.25in 800k disc drive, A3000 interface with discs and box, games, 1st Word Plus, boxed – £620. Contact Mr M Folkard, Northumberland. Tel: (0670 75) 265

● Master 128, monochrome monitor, Cumana double disc drive, Panasonic KX-P1081, printer, Interword, Intersheet, books – £300. Contact R Paton, Milton Keynes. Tel: (0908) 648815

● A3000, OS 3.1, 2Mb Ram, Acorn colour monitor, stand, Learning Curve package, excellent condition, original packaging – £650 ono. Contact Mr d Gibson, St Albans. Tel: (0727) 867873

● A3000, 2Mb upgrade with Acorn colour monitor, Citizen Swift 9 pin dot matrix printer with colour option software and all manuals – £690 ono. Contact Mr A Day, Wakefield. Tel: (0924) 373159

● BBC B, encased in Viglen housing with twin 40/80 disc drives, seperate keyboard, Solidisk sideways Ram, cassette, Interword, Intersheet, manuals, games – £350. Contact Mr P Ganuszko, Kent. Tel: (0474) 702961

● Master 512, twin 40/80 track double sided disc drives in Viglen case, colour monitor, Amx Stoppress, Superart, Design, Max, Co-Pro adaptor, Spellmaster, Viewstore, Roms, all manuals Questpaint – £650, will split. Contact Mr D Walker, Westwoodside. Tel: (0427) 753391

● Master 512, Microvitec 1451, dual 40/80 track drives, mouse, Viewstore Rom, manuals, 20 games, Mini office and Fleet Street Editor – £395. Contact A Baker, Cambridge. Tel: (0954) 780073

● Samsung 12in VGA mono monitor, model ML2611U, 18 months old, excellent condition, ideal for home word processing, spreadsheeting etc – £55. Contact Mr R Grant, Newcastle upon Tyne. Tel: 091-285 0097 evenings

● A3000, 2Mb, Acorn colour monitor, user/midi port and software – £600, Clares Armadeus, mono sampling card and software – £100. Contact Mr C Townsend, Bracknell. Tel: (0344) 412062

● BBC B, Issue 7, Z80, Torch twin double sided 80 track disc drives, various software, books, offers. Contact Mr P Turner, Grantham. Tel: (0476) 60840

● A410, 4Mb Ram, 40Mb drive, Pipedream 3, PC Emulator 1.2, colour monitor – £900 ono. Contact Mr G Carr, London N10. Tel: 081-883 8535

● 1st Word Plus release 2, all manuals, discs – £35, Risc OS 2, all manuals etc – £10. Contact Mr T Hopson, London E11. Tel: 081-989 8738

● A3000, 2Mb Ram, colour monitor, PD software – £550 ono. Contact Mr P Triner, Huddersfield. Tel: (0484) 510214

● BBC B, twin 40/80 5.25in disc drive, games, software, manuals, leads – £200. Contact Mr J Lemmer, Norfolk. Tel: (0263) 861321 after 8.30pm

● 6502 second processor – £60. Contact Mr G Hallam, Worcester. Tel: (0905) 354740 after 6pm

● BBC B, 5.25in double disc drive, black/white TV monitor, manuals, many extras – £100 ono. Contact J Harrington, Farnborough. Tel: (0252) 548893

● BBC B, Issue 7, Viglen cased twin drive, ATPL board, View, Viewsheet, Replay, Quest Paint, mouse, joysticks, Okimate colour printer, recorder, educational games software – £250. Contact R Hartley, Lichfield. Tel: 90543) 264241

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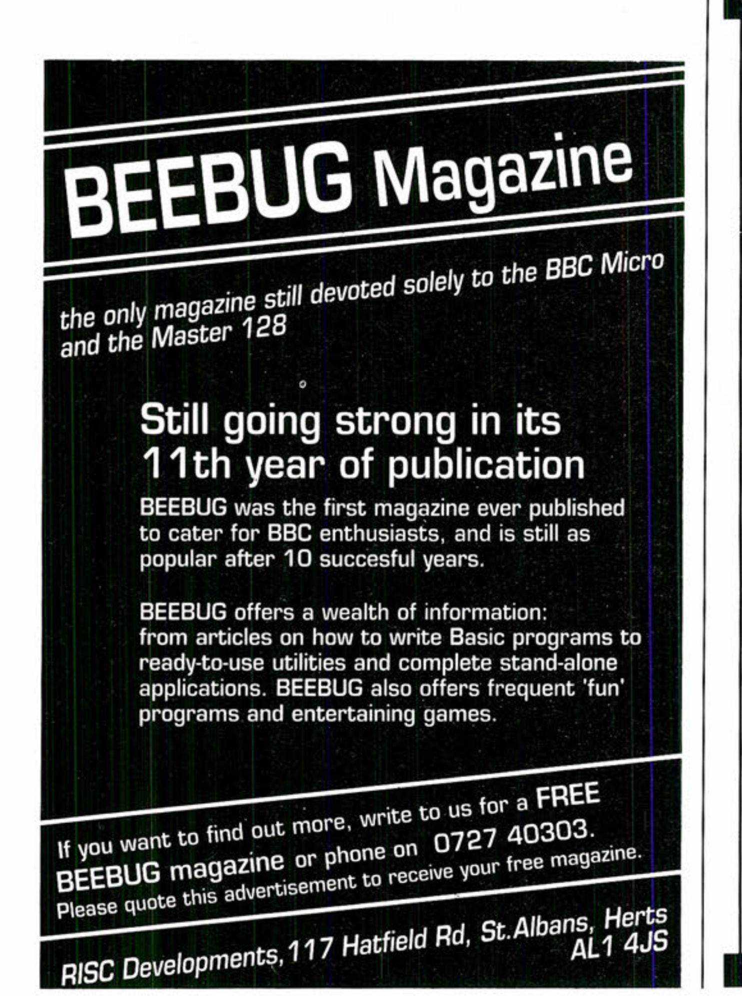
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TRUE TO TYPE

Richard Garrett hangs out at the Electronic Font Foundry and hammers out a few ideas about typography


ANDREW WHITELEY

There's a lot more to fonts than squiggles on paper. Whether for reasons of legibility, visual appeal or emotive impact, the shapes of letters contribute significantly to the messages they convey. Many newspaper readers in the UK, for example, can distinguish articles from *The Times*, *The Guardian* or *The Independent* by their typography alone (though they probably can't tell you how they did it) and fonts suitable for wedding invitations are obviously out of place in scientific journals.

Fads and fashions in typography come and go over centuries yet, still, people invent new shapes and uses for the same bunch of characters. Since the advent of computers, high-resolution printers and font editing software, typeface design has become available to a huge number of people not previously in possession of a lead foundry.

While this is a Good Thing, it has also produced some appalling typesetting. This is due, in part, to the fact that most 'enthusiastic amateurs' have not studied design and typography and perhaps lack an appreciation of the tools available. As one such enthusiast, I paid a visit to the Electric Font Foundry to find out what makes a good typeface. Here are some of the things I discovered . . .

OF A TYPE

The words font and typeface are confusing. When type was lumps of lead arranged in a printing press, a font was a wooden tray containing all the letters with the same typeface, attribute, weight and point size. Today, with scalable fonts like those in Risc OS, size isn't important, so 'font' has come to mean all the letters of a particular design, weight and attribute; for example, Helvetica Bold Italic.

With all the accents, diphthongs and other special characters that can exist, a complete font often contains 300 to 400 characters. This is a problem for computers which, in general, can only handle an 'alphabet' of up to 221 characters at a time (256 Ascii codes less 32 control codes and DELETE). In the UK, the most

COMPARABLE FONTS

TRADITIONAL /PS	RISC OS	EFF	OTHERS
Courier	Corpus	EvenWriter	Messenger
Helvetica	Homerton	Swiss	Helv, Geneva, Neue Haas Grotesk
Times Roman	Trinity	EFF_Times	Times, TR, Claritas,Tymes Roman,
Benguiat		Ben	BG, Ventura, Matrix, Uranus
Copperplate Gothic		Formal	Spartan, Aquarius, Scotsman Royal
Gill Sans		Eric	Hammersmith, Glib, Graphic Gothic
Goudy		Frederic	Grecian, Number 11
Palatino		Michael	Palatine, Palacio, Michelangelo

ANATOMY OF A FONT

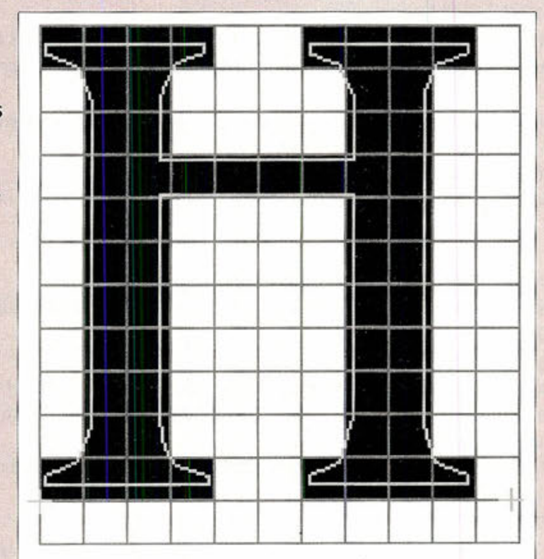
OUTLINES

Under Risc OS, font details are held in two files called Intmetrics and Outlines. The smaller intmetrics file lists the relative widths of every character in the font/alphabet. This is used to speed up text realignment when you make alterations. If you change the body style of a large DTP document, for example, the software doesn't redraw every character in the document before rearranging text on the current page. It just uses intmetrics data to calculate the necessary changes in line length on all the preceding pages.

The larger Outlines file, as its name suggests, contains outlines or 'skeletons' of every character in the font. An outline is rather like a *Draw* file, containing a base line and the Bezier curves that make the shape of a character. Risc OS outlines also contain lines called 'scaffolding'. These form global links that fix the height and width of characters and strokes throughout the font. In Risc OS 3.1, all these elements can be altered using the font editor.

Fonts are generated for screens and printers by scaling each outline to the required point size, superimposing it on a grid whose size matches the resolution of the device and then creating a second, bitmap image of the character. These bitmaps are stored as a 'lookup table' in the font cache and are then poked into screen memory or printer output as required.

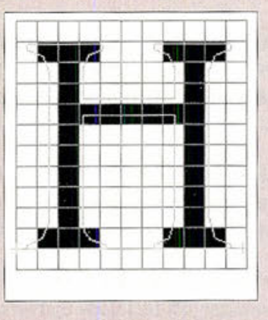
HINTING

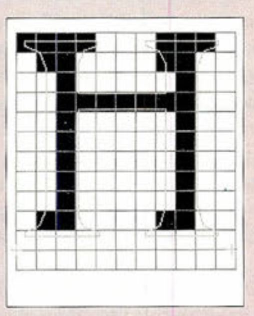


The basic rule for making bitmaps from outlines is this: If more than 50 percent of a pixel falls within an outline, it is filled, otherwise it is left blank. This sounds good in theory but with coarse bitmaps (less than 1200dpi), the resultant shapes can vary enormously as shown in the diagrams on the right.

Consider a capital 'H' with vertical strokes 2.8 pixels wide. If the centre of the stroke falls on a cell boundary, with 1.4 pixels either side, then the two middle cells are filled but both 40% edge pixels are left blank creating a stroke two pixels wide. If, on the other hand, the edge of the stroke falls on the boundary, two full pixels and an 80% pixel are created, all three of which are filled. The results are an assymetric font which may even have missing serifs.

This effect can be corrected by the use of hinting. Well designed fonts contain additional code that standardises stroke heights and widths by fixing the alignment of characters to the pixel grid.





Hinting also eliminates the problem of disappearing curves in small characters. If a thin curve or slanted line crosses a grid at an angle, it is quite possible that it will pass through several cells without filling 50 percent of any of them. In this case the line will disappear altogether or, if some pixels are filled, will appear as an irregular bunch of dots. In Risc OS, font designers place 'skeleton lines' in the middle of curved outlines so when the bitmaps are drawn, these force the pixels they cross to turn black producing continuous strokes.

ANTI-ALIASING

This is not a function of specific fonts but a part of Risc OS designed to reduce the familiar 'staircase' effect that occurs when computers draw non-orthogonal lines. When Risc OS creates bitmaps from font outlines, it actually does so at four times the resolution required by the current screen mode so that each pixel is treated as a 2x2 grid. The computer runs the '50 percent rule' on all the 'sub-pixels' in this finer array and then examines each block of four.

If all four cells are empty the pixel is left blank; if one cell is filled then the pixel is coloured light grey and so on, getting darker until four 'hits' give black. This produces an optical illusion where lighter edges seem to move towards the darker areas of each character to create smooth lines.

common alphabet is Latin 1 (ISO 8859/1) which can be used to write Danish, Dutch, English, Faroese, French, German, Icelandic, Irish, Italian, Norwegian, Portuguese, Spanish, Swedish and, in EFF fonts, Welsh. And as if that wasn't enough, ISO Latin 2, 3, 4 and 5 between them cover most other 'European' languages. Other alphabets include Cyrillic, Greek, Devanagri and Punjabi languages as well as symbol sets like Braille, Chess, Maths, Music and Dingbats. When you buy a 'font', you normally buy the set of different weights and attributes that make up a whole 'typeface family' in a particular alphabet.

WHO'S WHO

Some fonts are designed by the people selling them (for example EFF's SciFi) or, like Sasoon.Infant, a font for infant schools, sold under licence to the original designer. Others have a longer history.

Many of today's typefaces have existed for hundreds of years and their designs are no longer copyright. Manufacturers selling them in digital versions, usually ITC or Adobe, have adopted the traditional names (Garamond, Times Roman, Baskerville and so on) as trademarks.

Although anyone can produce a font to a traditional design, it is illegal to sell it under an established name without paying the owner a sizable licensing fee. In this context 'producing' means drawing it yourself and not lifting it out of *Corel Draw* and then flogging it, unchanged, as your own work.

FONT TO FONT

PostScript is a powerful and wonderful language, but its complexity is such that many people have problems using it. This often due to the variety of ways it handles fonts.

There are three methods of connecting Risc OS fonts to PS printers. The first is called 'mapping'. This is used when identical fonts exist in both Risc OS and the printer, but under different names (for example Trinity and Times Roman). Mapping speeds up printing by telling Risc OS to change the name of a font

AUTOKERNING AND RISC OS 3

If you create a line of text from rectangular bitmaps by placing them edge to edge, the space between a letter pair like 'AV' will be much greater than the space in 'HI'. Kerning allows you to adjust these gaps to make the test look prettier, and the difference between kerned and non-kerned text can be seen below.

Kerning is available in Risc OS 2 but only manually. For instance, in *Impression*, the command CTRL-E enlarges letterspace and CTRL-R reduces it. One of the advantages of Risc OS 3 is that it has introduced a major font facility known as autokerning. Risc OS 3 font definitions can include a table of 'kerning values' for each letter and some difficult letter pairs. When programs print or display a font, they can read these values and space the characters automatically. This autokerning option in Risc OS 3 implies that programs could also implement something called 'track kerning', a subtle version of left/right justification that alters gaps between letter rather than spaces between words and eliminates 'rivers'.

TOTAL AVIATION
TOTAL AVIATION

EFF already produce fonts that allow autokerning, but at present very few people are using this facility. The reason is that, although auto-kerning is an integral part of OS 3.1, it has not yet been introduced into existing software. At the time of writing, the only packages that use auto-kerning are Clares' *Titler* and *Vector* by 4Mation. Computer Concepts says that the facility will appear in *Impression* version 2.5 which is expected in April or May. Finally, a tip to remember when you eventually get hold of auto-kerning is that the Risc OS font editor does not save kerning data when you edit and save a font. Just one more reason for backups!

FONT WORDS

ATTRIBUTES: Variations that distinguish fonts within families. These include Condensed, Extended, Small Caps, Italic and Oblique (not the same thing at all). Designed correctly, these are different versions of the typeface as opposed to a regular font 'squashed' or 'twisted' by computer.
BASE LINE: An imaginary line that letters sit on. In fact very few letters actually sit on this line. This is particularly true of curved characters. Because circles of a given diameter appear smaller than squares of the same edge length, o's are drawn bigger than x's.
BITMAP FONTS: Fonts whose letters are small pictures made up of pixels; they distort when enlarged or reduced.
BODY COPY: The main part of a page of text, not headings or captions.
BODY STYLE: The style of the text in the body copy.
CAP HEIGHT: The height that capital letters extend up to from the base line. Some rounded ones or sharply pointed letters extend above this.
CHARACTER: A single letter.
DISPLAY FACE: Typeface designed for use in small amounts at quite large sizes.
FIXED PITCH FONT: A font in which every character takes up the same amount of horizontal space, like characters made by a typewriter, for example: Corpus
FONT: All the characters in a single typeface, for example Times Italic.
FONTITIS: An affliction suffered by inexperienced DTP operators. Symptoms include many different typefaces in lots of sizes and weights on the same page, everything set in upper case, and lots of shadows, auto-expanded, auto-condensed and other distorted text.
HINTING: Extra information coded into fonts which ensures the characters remain symmetrical and correctly shaped when displayed on screen or printed.
LEADING: Extra space added between lines of text.
OUTLINE FONT: Fonts in which letter shapes are described by Bezier curves and can be scaled to any size without any loss of shape or accuracy.
PIXEL: PIcture ELement. A single dot in a screen display or printout.
POINT SIZE: The size of the letters (in 1/72ths of an inch) used to set the text. In the days of metal type, the point size referred to the 'height' of the piece of metal that held the character. Today, there is no such piece of metal so point sizes can appear arbitrary and differ considerably from face to face. The typeface designer decides how much space there should be between lines of text if no extra space, or leading, is added. The overall height of the actual letters plus this minimum adds up to the point size.
POSTSCRIPT: A page description language developed by Adobe Systems Inc. for laser printers and typesetting machines. Your application turns the picture on screen into a program which is interpreted by a microprocessor in the printer. This draws the whole page in memory before printing it out. You can also write programs in PostScript.
PROPORTIONAL SPACED FONT: Font in which all the letters have different horizontal widths.
RIVERS: Wiggling vertical lines of white space that flow through computer justified body text when wide gaps between words join together over successive lines.
SERIF: Short terminating lines at the ends of letter strokes as in typefaces like Times. Typefaces without serifs (for example Helvetica) are called sans serif.
TYPEFACE OR TYPEFACE FAMILY: A group of fonts with the same name: Times, Times Italic, Times Bold, Times Bold Italic.
WEIGHT: The weight of a typeface is its overall appearance of light or black. A bold or heavy font appears darker because character strokes are thicker and less of the white page shows through.There is no absolute measure of boldness or lightness, one boldface type may actually be lighter than another in regular type. Weights include light, extra light, regular, demi bold, ultra bold and black.

before sending it to PostScript. Problems occur when the 'soft' font in question is absent from your printer.

The second method, which Risc OS calls 'download', involves sending fonts to the printer at 'start of day'. But, if you do this and fill the printer's Ram with all the fonts you'll ever need, large print jobs can overwrite these fonts in memory and crash the printer. The slowest but often the most reliable method is to download fonts as part of each print job. In this case, all the information you need for your final image is sent at run time. This is vital if you are sending PS files to print bureaux.

At various points in printing, PS also requires information stored in files called encoding vectors. This data varies between fonts, so it is important that the computer knows which encodings to send with which font, and where the files containing them are held within the printer driver.

Problems encountered with PS are frequently due to missing or overwritten fonts or encoding vectors. If you use EFF fonts, you can save a lot of time by buying the company's PostScript upgrade disc. This contains five 'run once' utilities that upgrade your PS driver to their entire range of fonts. They say it solves most common PS problems but, if you have OS 3.0, EFF strongly recommends that you upgrade to 3.1 as well.

CONCLUSION

This is just the tip of an iceberg. Books on the technique and aesthetics of font design and typography might fill whole libraries. Suffice it to say, after my day at the Electric Font Foundry, I shall never look at a page of printing in quite the same way again.

PRODUCT DETAILS

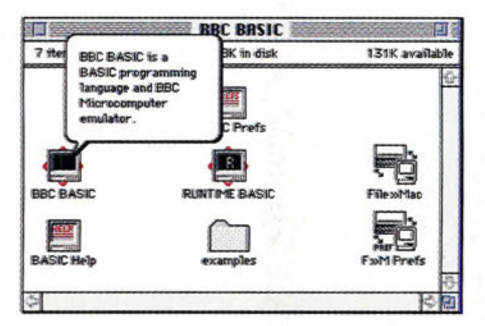
Product: EFF Fonts for Risc OS 2, 3.1 and PostScript Type 1
Supplier: The Electric Font Foundry, 50-52 Upper Village Road, Ascot, Berks, SL5 7AQ
Tel: (0344) 28698
Price: from £7.50 to £160+VAT.
PostScript Upgrade disc; £7.50 +VAT

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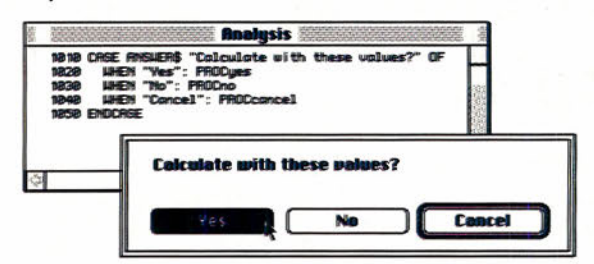


Balloon help provides instant information about the menus and dialogue-box options.

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Runtime BASIC utility converts your BASIC programs into stand-alone double-clickable Macintosh applications.

Macintosh-style interactive editor provides a scrolling view of program listings with convenient cursor or mouse editing. You can work with any font available on your system and you can display keywords highlighted in bold for easy reference.



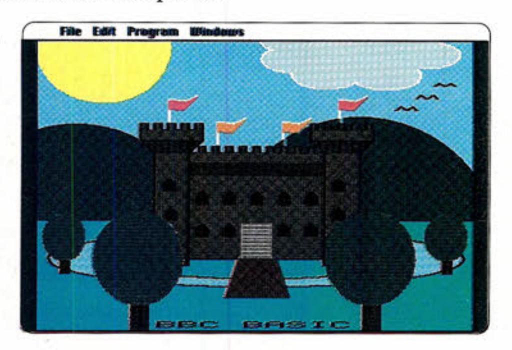
Macintosh Toolbox interface allows you to define your own menus, dialogue boxes, and scrolling lists using convenient BASIC keywords, and use the standard file dialogues for opening and saving data files.

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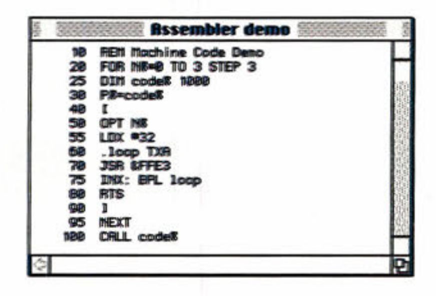
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ORCHESTRAL MANOEUVRES

Richard Garrett looks at music education on the Arc

With the National Curriculum's emphasis on Information Technology, the composition element in GCSE and the growth of Music Technology courses in both higher and further education, computers are rapidly becoming commonplace in music education.

For some traditionalist teachers, the music classroom may have seemed like the last bastion against 'left brain' digital monsters invading the school but now, however reluctantly, even music departments are coming to terms with the Arc.

This month, we advise one music teacher on her plans to explore the possibilities and challenges of music on the Archimedes . . .



Photo: ROBERT CLIFFORD / Stylists: POLLY GORDON & KATIE CLARK / Model: FIONA REED / Clothes: NEXT / Cello: BEAT AROUND THE BUSH

TEACHER'S TALE

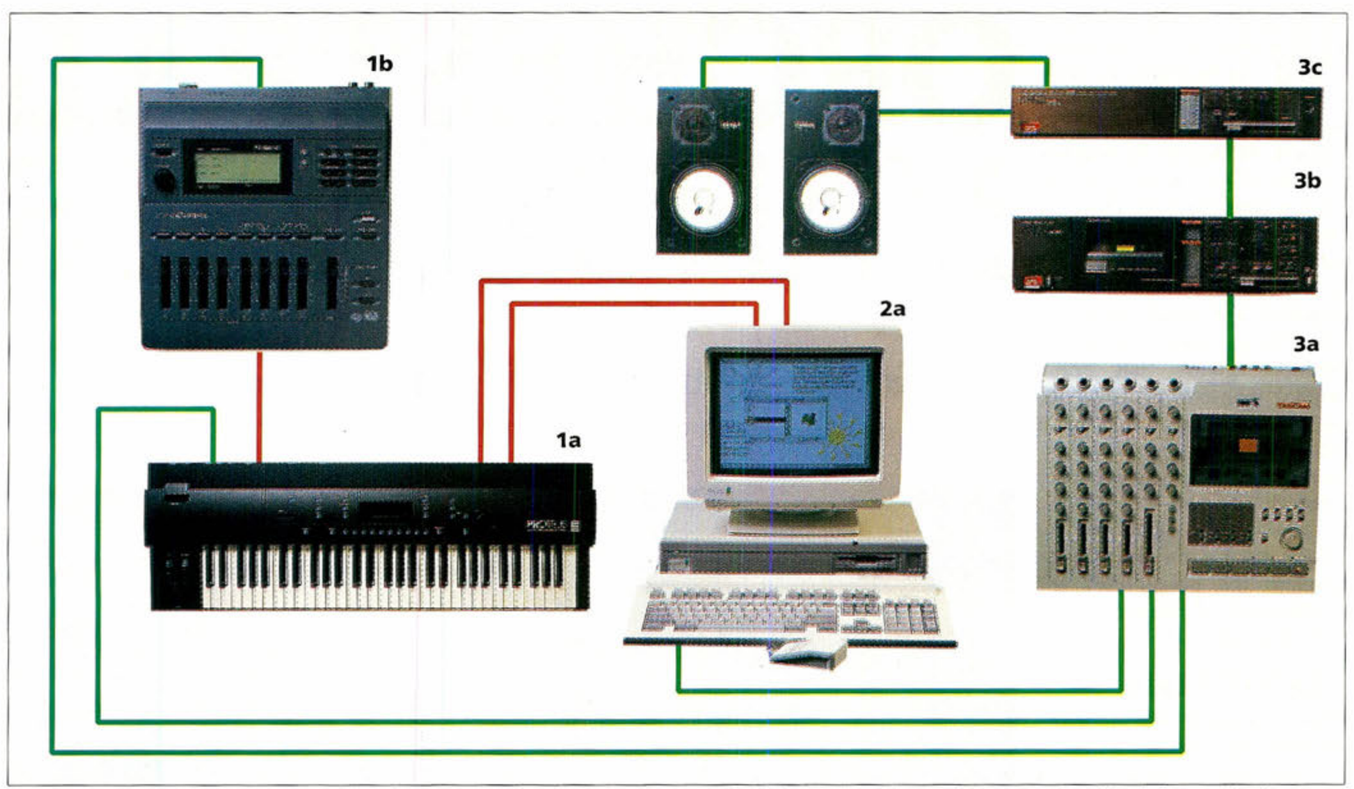
Kate Thomas is a music teacher who wants to establish a new music setup in her school making use of the Archmedes. This is what she told us:

'I'm one of two full-time music teachers in a medium-sized comprehensive school. I had a conventional education in classical music. I started playing cello and piano when I was at school, did a university degree in music and then a teacher training course. I used computers to write up a few essays while I was at college but, apart from that, I've managed to avoid them.

'The school where I work has quite a few Archimedes and BBC computers, most of which are located in network rooms that staff book for classes and which the children can use on open access at lunch time and sometimes after school.

'Over the last couple of years, the school has put computer equipment into a number of other classrooms and, this year, I've been asked whether I want an Archimedes for the music department. I'm keen to take up the offer but I don't know what to ask for.

'What I do know is what I want it to do. I want to use the computer like a word processor to write out parts for the children to play and, if I can, to place musical examples within typed worksheets resorting to scissors and glue.



The diagram shown above shows how the various types of musical equipment can be linked up to Kate's machine. A keyboard (1a) plus a Roland SC-155 Sound Canvas (1b), and a Tascam 424 mixer (3a) are the musical components. The A5000 (2a) is fitted with a Midi card and uses Longman Logotron's *Notate*. A domestic hi-fi (3b, 3c) is what Kate will use to play the sounds. Musical equipment by Music Connections 071-731 5993.

COLOUR KEY: ——— Midi data ——— Audio signals

PRODUCT DETAILS

The following hardware costs do not take into account any savings from educational discounts or from price reductions commonly offered by musical instrument dealers or, for that matter, the £400 you could save when an A4000 Midi podule appears. Dealers such as Music Connections can supply most musical hardware.

A5000 HD80: £1399 from Acorn (0223) 254254
Midi podule: £65 from Acorn
SC-155 Sound Canvas: £659
Headphones: £20 from any hi-fi store
Assorted Midi and audio cables: £20 from any electronic musical equipment dealer
Total hardwarecost: £2,163

OTHER POSSIBILITIES:
If you were building such a setup from scratch, you'd also need a Midi 'mother keyboard' and, optionally, a cassette multitrack tape recorder. Here are some examples
Cheetah 550 'mother keyboard': £400
Tascam 424 portastudio: £479
Yamaha TG-100 GM module: £349
Zone GMX-1: £249
Boss Dr Rhythm 550 drum machine: £385
Em-u Proteus 2 sample player: £499

MIDI SONGFILES
Words & Music 091-529 4788: classical, ragtime, drum patterns (Arc format)
Protracks Ltd. 081-763 2225: pop, jazz, standards (PC format)
Digital Music Archives 071-624 8774: classical (PC format)
Hands On (0705) 221162: pop, jazz, standards (PC format)

SOFTWARE:
Notate: £59from Longman Logotron (0223) 425558
Studio 24 plus: £212 from EMR (0702) 335747
MicroStudio: £67.23 from EMR (0702) 335747
Score Draw: £61.95 from Clares (0606) 48511
Rhapsody 2: £61.95 from Clares (0606) 48511

'If possible, I'd like the machine to help children analyse classical and popular scores. Most of all, they should be able to experiment with stave notation; to put notes into a computer and hear what they sound like. I think this would give them a more direct experience of written music than trying to follow my piano playing.

'I'd like to have enough electronic instruments so that more able students could compose complex pieces of music on the computer but I'm a bit concerned about their monopolising it. From what I've seen of modern composers at work, writing on computer seems to involve one person using an awful lot of equipment for long periods of time.

'Is there any way that some composition and arrangement could be done on our open access computers before being transferred to a more sophisticated setup?

'We already have some equipment in the form of two Yamaha DX7 keyboard synthesizers, some four-track cassette recorders and some amplification which, if possible, I'd like to incorporate into whatever system we put together. Education funding being what it is, I'd also like to invest in equipment that will not become obsolete too soon.'

WE RECOMMEND . . .

What Kate needs is to have a spread of packages with which she and her pupils can experiment. For students who want to get into serious Midi composition, full blown sequencing package like EMR's Studio 24 plus would be useful, and for easier sequencing combined with keyboard practice, the EMR *MicroStudio* package could come in useful

as well. When it comes to analysis, one useful aspect of Midi is the Standard Midi File (SMF). SMFs are essentially musical scores stored in a digital format that you can load into any sequencer and play electronically.

Once the music is in the computer, you can alter its tempo without changing the tuning, edit it and change the relative volumes of different parts. If you silence a single 'track', you can play along in the style of the old 'music minus one' records.

Over recent years, a small industry has grown up in selling arrangements in this standardised digital format instead of as sheet music. Many suppliers concentrate on arrangements of the latest pop music, but a sizable minority are now flogging SMFs of anything from Beethoven to Be-Bop and beyond.

These days, most dealers supply 'songfiles' which are compatible with General Midi. To my knowledge, the only dealer to sells SMFs in Archimedes format is Words and Music, but a large number supply MS-Dos discs that can be loaded under Risc OS 3 or *MultiFS*.

As to easy composition software for Archimedes machines without Midi, I would suggest that the school purchase a multiple licence for Longman Logotron's *Notate*, a stave-based sequencer that uses the eight monophonic sound channels on the Arc. Students could experiment with melody, rhythm and harmony on 'unMidied' Archies with *Notate* and, having completed the initial stages, transfer their work to the Midi environment using SMFs.

They could then develop arrangements further in a more powerful sequencer, print out more sophisticated sheet music using a package like Clares' *Rhapsody* or *Score Draw*, or simply hear their work played on a more powerful system.

If the school were to buy several pairs of cheap headphones, a whole class could take over your network room and work on dozens of different tunes simultaneously. And you thought one loud 'Walkperson' on the tube was bad news . . .



MUSICAL HARDWARE

I suggest that you invest in a hard disc Archimedes as the basis of a Midi workstation for your classroom. For ergonomic reasons, I'd go for a three-box model, so that the screen and processor box can be placed at eye-level above a synth keyboard with the computer keyboard and the mouse to one side. When a Midi podule is released for the A4000 this would also make a good choice. Hard disc systems are particularly useful for non-networked machines in schools because students can call up programs on their own without hassling you for the discs.

Having chosen your Arc and Midi podule, you need to invest in some more sound generation equipment. Yamaha DX7s were once regarded as the bees' knees in performance synthesizers, but they play only two 'voices' at a time and are limited as sound sources for composition. In their day (1983-86) they were considered quite expensive 'professional units' and so have good-quality keyboards that are quite comfortable to play; if don't mind plastic. This being this case, a Yamaha DX7 would make an admirable mother keyboard that you could use to input Midi data into the computer and drive a more sophisticated sound module.

For this modulé, which takes Midi instructions from the keyboard or the computer and turns them into sound, I strongly recommend that you purchase a Roland SC-155 Sound Canvas. This unit can play up to 24 notes simultaneously, and has 16-note multi-timbrality, that is, it can use up to 16 different 'voices' at a time. It has 315 built-in instrumental sounds including pianos, saxophones and gunshots as well as seven predefined drum kits.

I particularly like this box because it has 'slider' controls on the top which allow you to balance the volumes and stereo positions (pan) of all the different musical parts. This is a significant improvement on the baffling multi-function buttons and tiny LCD displays found on most modules.

My other reason for recommending the SC-155 is that it's a 'General Midi' (GM) device. GM is a development of the Midi specification which was added in 1991 to provide greater compatibility between sound generators. Among other things, it includes a standardised list of 128 numbered 'voice assignments'. This means that when you select voice number 78, for example, on a GM module, the sound that plays will always be that of a Shakuhachi flute – as on all those Peter Gabriel records – irrespective of which manufacturer built the box. Talk to any experienced user of Midi gear, and he or she will be only to glad to share their experience of flute sounds turning into air-raid sirens on the day they first plugged the new synth into their computer.

If, in the future you build further Midi workstations in your classroom, the sound modules you buy will undoubtedly be cheaper and have more sophisticated sounds but, as long as they are 'General Midi capable', a computer sequence written for the Sound Canvas will sound recognisably similar when played on the new system.

If you were going to use this gear exclusively for electronic music, you could buy a pair of headphones for the Sound Canvas and stop there, as far as hardware is concerned. Since this insular approach is the very thing you want to avoid, I suggest that you combine it with one of your four-track 'portastudios' and an amplifier. This would allow students to record computer compositions in collaboration with human instrumentalists.

TECHNIQUES

The most useful package from Kate's point of view will probably be the Longman Logotron package, *Notate*, that I recommended for Kate's open access computers. This package can write and arrange tunes in up to eight-part harmony or in four parts with a chordal accompaniment.

It comes with a variety of sampled voices and has both Midi output and score printing options. When you open a new *Notate* window, what you see is a tape-recorder control panel and a five line treble stave which defaults to a 4/4 rhythm in C major at the ubiquitous tempo of 120 beats per minute. For this example, I'm going to use *Notate* to create a simple eight-bar melody.

Melody is defined as 'a group of single notes arranged in a recognisable pattern'. In other words, it's a technical term for 'a tune'. One could argue that any group of single notes could be called a melody and whether they are 'tuneful', is a matter for the ear of the beholder. Such aesthetic questions are, of course, beyond the scope of this article.

When writing a tune from scratch, you must start by considering a few of its basic characteristics. First, what notes are you going to use to make up the tune? Unless you're heavily into Schoenberg or contemporary jazz, it's unlikely that you'll feel comfortable writing tunes that use all of the 11 notes that are available on the stave, so it's a good start to limit the set of notes, or the 'scale' that your tune will use.

Let's stick with the seven notes that make up the key of C major. This is *Notate*'s default key signature and has no sharps or flats in it. Any tune played on the white notes on a piano will be in C Major.

Next, what rhythm is it going to follow? You could base it around a two-beat cycle (a march), three beats (a waltz) or four (just about every bit of pop music in the last 30 years). I chose the 'six-eight' time signature common among Irish jigs, nursery rhymes and other forms of 'diddly diddly' music. To set *Notate* to a particular time signature, you

open up the main menu, select 'Song', then 'Time Signature' and then change it using the arrows provided. At this point, I also slowed the tempo down to 100bpm by altering the metronome setting on the control panel.

Now it's time to get creative. Simple tunes generally have a lot of repetition in them, so a useful approach is to write a couple of bars that sound vaguely interesting and repeat them a few times with variations to create the melody. In *Notate*, you write tunes by selecting notes from the range of time-values on the control panel and dragging them on to the stave with the mouse. When you let go of the mouse, you hear the note.

If the pitch is not what you want, you simply pick the note up again and drag it to another point on the stave. To discard a note, you drag it back to the control panel and release it there. Every so often during editing, you can hit the red play button on the control panel to hear how the whole tune is getting on. After faffing around, I came up with an innocuous two-bar twiddle.

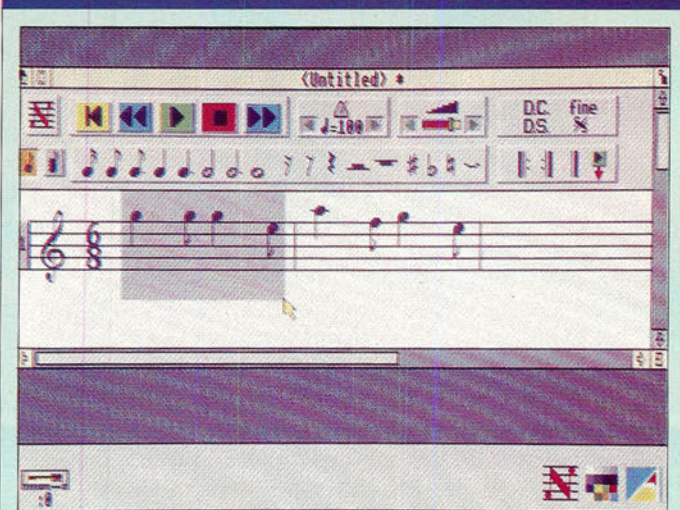
Once you've created this first 'building block' for the tune, the next thing you could do is repeat some of it. You choose the notes you wish to duplicate by clicking on the Select button and dragging the mouse across them.

You then hit the copy option (CTRL-C), and the cursor changes into a small icon showing two notes. When you move this to another part of the stave and click on Select, the copied data is inserted at that point on the page.

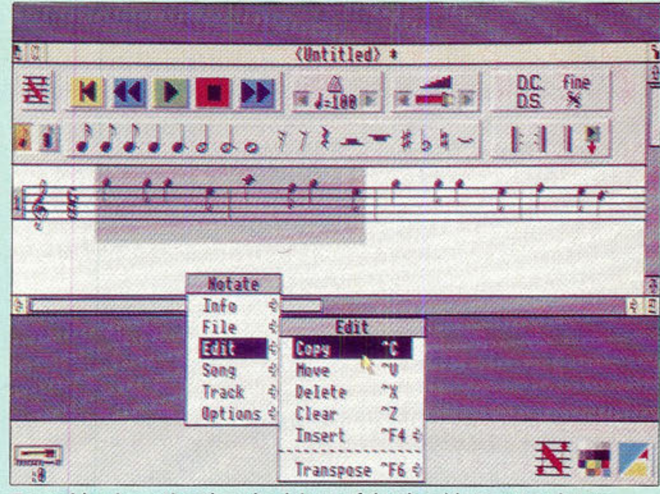
In my case, I copied bar one into bar three and, after a little more time 'being creative', bar four made its appearance. At this point, it may help to see all four bars on the screen at once. This is achieved by calling up the 'small notes' option from the menu.

By now, my eight-bar masterpiece was half done; in fact, more than half, thanks to the magic of gratuitous repetition. My next step was to copy the whole of bars one and two into bars five and six and then to finish the whole thing of with a closing phrase I nicked from the theme to *Andy Pandy*.

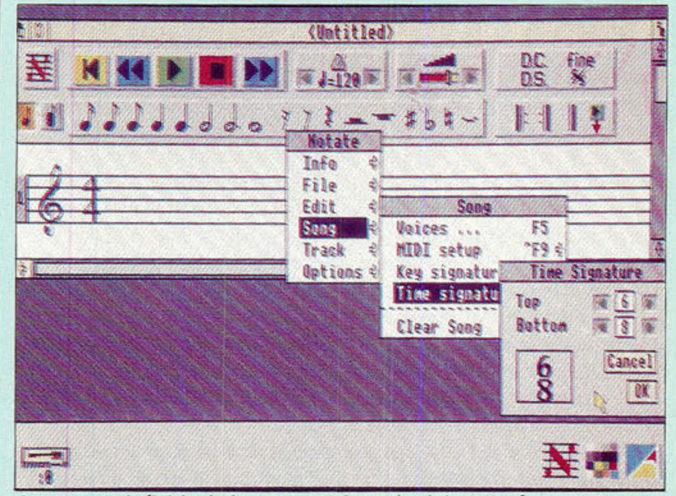
NATURAL NOTATION



Starting out in *Notate* is not a difficult matter. Notes can simply be selected from the control panel at the top of the screen and placed on the stave. The package offers instant feedback, and when the note is placed, it is immediately played.
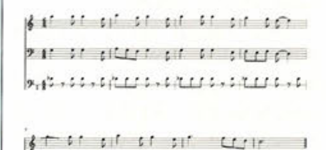


To avoid re-inventing the wheel, its useful to be able to cut and paste sections of music. *Notate* allows you to do this easily, and, if you wish, transpose the tune to another key. By clever and creative use of repetition, quite long pieces can be assembled easily.



Once a tune is finished, the next step is to play it in some form. *Notate* allows you to play out masterpieces with a variety of time signatures, and to set it up as a General Midi file. *Notate* is the package of choice for education because of its speed and ease of use.

Of course, this was only the beginning. Having created my basic melody, I called up the Create Track option from the Track sub-menu and wrote a bass line. This is easier than it sounds at first.

All you have to do is copy the top line into the second track, transpose it down a couple of octaves and then mess about with it. So, I'm not quite Stanley Clarke but there again, who is? This done, I added in a tambourine part and printed it out . . .



For reasons of printing, the illustration is a *Draw* file produced by passing the tune as an SMF to *Rhapsody* and *Score Draw*, but printouts are also obtainable straight from *Notate*.

FUTURE DEVELOPMENT

If this installation is successful and when the funding allows, I suggest that the school repeat this process by buying another hard disc Arc and a GM module to complement the rest of their existing gear. With the current cross-platform interest in Midi as a sound control system for multimedia, music hardware costs are likely to keep going down for the foreseeable future.

Other Midi hardware to consider will depend on how the existing equipment gets used. If it gets leaped on by lots of teenage dance enthusiasts, then a drum module for the complex rhythms would take the pressure off the GM unit.

If, on the other hand, your users want a better experience of their own symphonic grandeur, you could consider an Em-u Proteus 2 sample player. The Proteus 2 is the 'orchestral' version of Em-u's range of sample players; it's not a General Midi machine, but it sounds lovely.

STAY IN PLAY

Next month, we'll be looking at music for programs, *Sound-Tracker* players, and sampling.

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This software package, developed in association with Acorn Computers, converts a RISC OS based Archimedes into an X Terminal. The software will allow communication with X clients over Ethernet or Econet.

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Transputer & i860 Systems

Gnome Computers offers a complete range of transputer and i860 boards to fit into either RISC OS or RISC iX based Archimedes machines. Prices start at £1385 for a single 10 MIP, 2 MFLOP transputer system including a parallel FORTRAN-77, C, Pascal, Modula-2 or Occam compiler.

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CODERS' CHOICE

Dave Acton examines two products that may tempt you away from Edit

If ever there were a universal utility, I suppose it would have to be the text editor. For many, *Edit* caters for all eventualities, but there are a couple of products on the market that might tempt you to buy a new version of this most fundamental of programs.

Some time ago I reviewed *DeskEdit* from Risc Developments. Its sequel, *DeskEdit 2*, has now appeared, offering, it seems, even more reasons to upgrade from dear old *Edit*.

However, making the picture more complicated, 4Mation has produced *DBEdit* – a desktop Basic editor. Add to the scene the latest version of *Edit* (1.44) which comes in your new Risc OS 3.1 Rom and the editor market has never seen such action before.

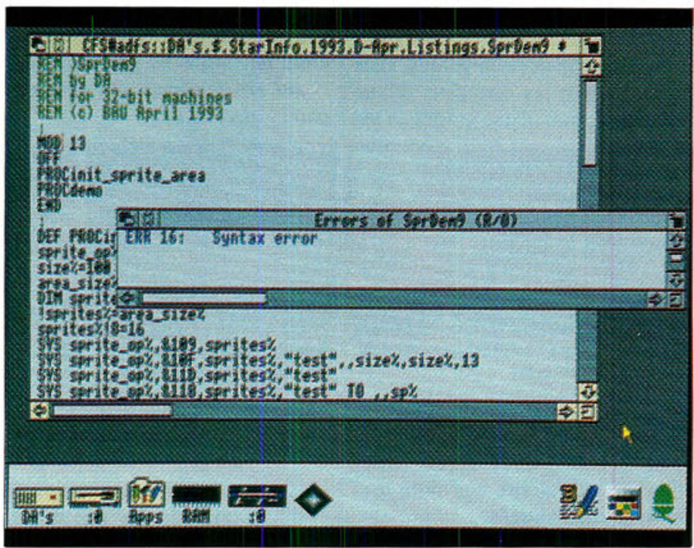
Which editor you choose very much depends on what sort of files you edit the most. This round-up is intended to highlight the strongest features of each, so you can make up your own mind.

DBEdit is designed largely for editing Basic programs in the desktop although it can handle text, obey files and so on. Initially, the Acorn Basic editor *ARMBE* (that used to come free with the machine) was probably the most popular choice with Basic programmers.

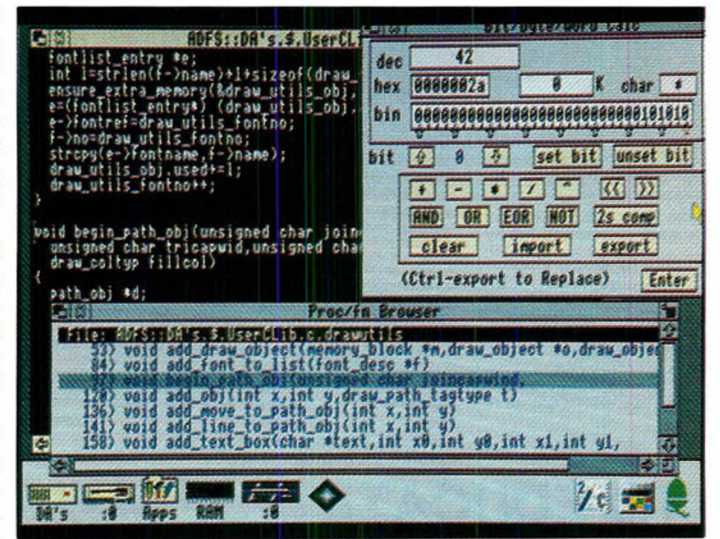
DBEdit is a natural progression from *ARMBE* in many ways, not least because it is a line-based editor. For example, there is a keypress to join the current line with the next, inserting a colon as necessary, and blocks are selected for copying, deleting and so on, on a line basis; most logical for Basic programming.

If you're used to *ARMBE* then *DBEdit* will probably seem quite natural to use. Some keys are the same (CTRL-C to copy) but others mimic different applications (CTRL-X to delete)

DeskEdit 2 aims to be more general-purpose, although the latest version has many new facilities, including renumbering. Searching has come a long way. *Edit 1.44* and *DeskEdit 2* both feature 'power searching', enabling fairly elaborate searches and replaces. *DeskEdit 2* also has a 'quick search' when you don't require all the full-blown features.



DBEdit is useful for editing Basic programs on the desktop



DeskEdit 2 includes a scientific calculator

DBEdit includes a one-key search facility so you can jump to one of four user-definable strings with one keypress.

Browsing and indexing are *DeskEdit 2*'s and *DBEdit*'s respective names for similar and very useful enhancements to searching. The idea in each case is to look through a file for one or more keywords, building a list in a new window of all occurrences. Then, clicking on any entry in the browse or index window takes you to the appropriate place in the file. It's particularly useful to have an index of DEF PROCs and *DBEdit* permits preceding or following REMs to be listed as part of the index.

On-line help also features heavily in the two new editors. *DBEdit* offers a comprehensive help file which can easily be indexed using the Index option. *DeskEdit 2* goes one further with a keyword help window; enter the Basic keyword and the appropriate help text is retrieved from a file.

Throwback is the new catchword for programming in the desktop and both *DBEdit* and *DeskEdit 2* offer 'error throwback'. In the case of *DeskEdit*, this links in with the Acorn Ansi C compiler and linker; any compilation errors are fed back to the editor, so you are taken to the exact trouble spot.

DBEdit offers the same facility for Basic programmers, and this may be a key feature when it comes to prising the die-hard command-line fetishists into the desktop world. When editing a Basic program, you can simply press CTRL-R to run it. If an error occurs, this appears in a throwback window and you can address the problem quickly.

Which you buy depends on what you do. For many, just upgrading to Risc OS 3.1 will provide a multi-feature editor suitable for boot files, Basic, C and assembler programs alike. *DeskEdit 2* is now a very sophisticated editing package, though, and well worth the money. *DBEdit* is a well-written alternative for Basic addicts and certainly makes desktop Basic programming a good deal easier.

PRODUCT DETAILS

Product: DeskEdit 2
Supplier: Risc Developments, 117 Hatfield Road, St Albans, Herts AL1 4JS
Tel: (0727) 840303
Price: £27.19+VAT

Product: DBEdit
Supplier: 4Mation, 14 Castle Park Road, Barnstaple, Devon EX32 8PA
Tel: (0271) 25353
Price: £30+VAT

... 32-bit Acorn home computers ...... Commodore Amiga ...... IBM PC /compatibles ...

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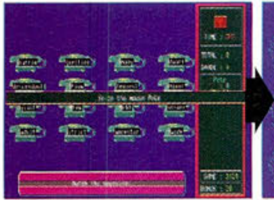
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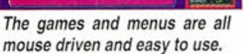


HOW THE SYSTEM WORKS...



A brief demonstration of the 10 out of 10 English package in action.





The games and menus are all mouse driven and easy to use.



The Main menu: Start by selecting New Player.



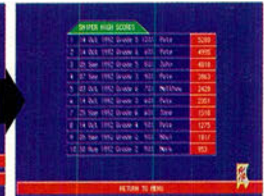
Pete's achievement chart is now set-up.



The Game Menu – Pete is ready to learn!



Each game has its own achievement summary...



... and a high score table to add to the fun!

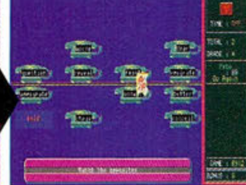
THE 10 out of 10 SERIES is an innovative collection of educational software. It covers traditionally accepted educational concepts and automatically records progress in a wide range of areas – all linked to the National Curriculum.

Children learn – and are assessed – by playing cleverly devised games, each with SIX grades allowing the child to progress at his or her own rate. Where appropriate, the achievement tables show the correlation of the grades to the National Curriculum statements. You start by entering your child's name. This automatically creates his or her blank achievement chart – the program can hold up to 64 of these (ideal for the average class or a large family).

Moving the mouse pointer around a chart you can discover exactly what a child will learn by playing a particular game at any grade. The achievement charts are automatically updated to record progress as the the six compulsive games are played.



Sniper: Rearrange the words – with correct punctuation.



Cover Up: Match all the words with their opposites.



Word Fit: Fill the grid – but only use verbs!



Grab It: There are plenty of collective nouns up for grabs!



Librarian: Sort the books, then match the adjectives.



Cheers: Discover the meaning of sayings.

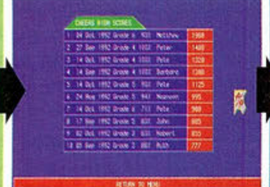
THE SIX CHALLENGING GAMES in each *10 out of 10* package are designed to be played by a child alone, with friends or with you. Each game has six grades to cover a wide age range and include practise levels where appropriate – you can easily set many options to suit ability and taste too! You can even leave the child and return later to check progress.

Children work their way through the six grades of each game trying to turn the achievement chart green as they go. As an illustration, the screen shots below show a middle grade of each of the six games in the English package – suitable for children at Key Stage 2 of the National Curriculum (age about 8 to 11 years).

Remember, all the games have five other levels and many features – such as graphics and speed – can be easily customised by parents or teachers. This flexibility makes *10 out of 10* English suitable for all ages and abilities from age six to sixteen.



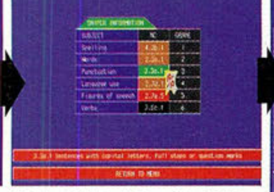
Children can print a certificate of achievement...



... and they love to see their name on the high score table!



By pressing R you can see the aim of the game at a glance.



Each game has its own achievement summary.

Pete : Achievement Record 10/10 English

SUBJECT	Sniper	Cover Up	Word Fit	Grab It!	Librarian	Cheers
Spelling	4.2b.1	4/5.5a	4/5.6h	2.2c.2	2.2c.1	
Punctuation	3.3a.1			3.6b.2		3.7b.2
Nouns		3.3e.6	2.5e.3	3.4d.3	4.2c.2	
Verbs	3.8c.1		3.3a.1			3.3[illegible]
Adjectives		2.1b.1			3.4e.2	3.3[illegible]
Language use	2.7d.1	2.8e.1		2.7c.3		3.5e.1
Words	2.2a.1		4.2c.1	3.7c.4		2.5e.1
Pairs		4.3c.1	4.3c.2		3.7c.4	
Sound patterns		2.2e.2	2.5e.3		2.3d.3	3.8c.9
Figures of speech	2.7e.5			2.2f.1	2.7e.2	

3.3e.8 Simple use of past tense

RETURN TO MENU

The achievement chart shows progress. By moving the pointer you can view a layman's interpretation of Curriculum numbers.

MOTIVATION & ASSESSMENT are provided in two ways: an **achievement chart** displays academic results and **high scores** show gameplay. The former records progress as the games are played:

RED means help needed. YELLOW means practise needed. GREEN means *10 out of 10*!

Now you can see where your child is not succeeding and use the various options to customise the games to help him or her progress more quickly. Children achieving 10 out of 10 in one or more grades can print a certificate – both on-screen and printed certificates are catered for. Children using the Early Essentials package are awarded stars too!

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Early Essentials

For Children Under 7 Years

Subject Areas Covered

Gnasher

Gr1	Recognise simple shapes and colours	Shape/Col
Gr2	Learn the order of the numbers 1 to 10	Numbers
Gr3	Learn the alphabet - with pictorial clues	Alphabet
Gr4	Simple sequences including odd and even numbers	Logic
Gr5	Discover properties of common objects	Science
Gr6	Experiment with numbers and operations	Table/Bond

Grab It

Gr1	Check shape and colour knowledge	Shape/Col
Gr2	Reading simple alpha-numeric look-up tables	Alphabet
Gr3	Improving reading/vocabulary	Words
Gr4	Recognising characteristics (size + shape + colour)	Properties
Gr5	Reading and understanding two-way tables	Logic
Gr6	Identifying scientific ideograms	Science

Link Up

Gr1	Match and link shapes and colours	Shape/Col
Gr2	Learn to count up to ten	Numbers
Gr3	Recognise the link between upper and lower case	Alphabet
Gr4	Link two shapes to composite pattern	Logic
Gr5	Match analogue to digital clocks	Time
Gr6	Know a selection of simple words	Words

Stones

Gr1	Understanding number conservation	Numbers
Gr2	Stepping through the alphabet	Alphabet
Gr3	Patterns of growing and shrinking shapes	Properties
Gr4	Learning to tell the time	Time
Gr5	Practising number skills	Table/Bond
Gr6	Using common sense to follow a sequence	Logic

Artist

Gr1	Colour and coordination skills	Shape/Col
Gr2	Counting with colours	Numbers
Gr3	Number stories with coloured rods	Table/Bond
Gr4	Following rules to recognise attributes	Properties
Gr5	Pattern and symmetry through shape and colour	Algebra
Gr6	Beginning a basic science vocabulary	Science

Racer

Gr1	Understand the meaning of push and pull	Science
Gr2	Following letters in alphabetical order	Alphabet
Gr3	Associating words and pictures	Words
Gr4	Elementary algebra – "find a number" problems	Algebra
Gr5	Knowledge of everyday items	Properties
Gr6	Accurate and rapid time recognition	Time

Maths (Number)

For Children 6 to 16 Years

Levels of Attainment Target 2 Covered

Carnival

Gr1	2a.1	Know and use addition facts up to 10	Addition
Gr2	3c.2	Understand remainders in a calculation	Division
Gr3	4a.2	Multiplication facts up to 10 x 10	Mult.
Gr4	5b.2	Calculate percentages of quantities	Percents.
Gr5	6a.5	Relate equivalent fractions to decimals	Decimals
Gr6	8c.1	Use of estimation to check size of answers	Estimate.

Grab It!

Gr1	3e.1	Use decimal notation with money	Units
Gr2	3b.2	Know and use the 2, 5 and 10 times tables	Mult.
Gr3	4a.5	Mental subtraction of 2 two-digit numbers	Subtract.
Gr4	4a.6	Mental addition of several single-digit numbers	Addition
Gr5	6b.1	Estimate multiplication and division	Estimate.
Gr6	7a.2	Division of multiples of powers of 10	Division

Cover Up

Gr1	3a.4	Know and use subtraction facts up to 20	Subtract.
Gr2	3b.1	Multiplication. facts up to 5 x 5	Mult.
Gr3	4a.4	Mental addition of 2 two-digit numbers	Addition
Gr4	4a.10	Division of two-digit nos. by single digits	Division
Gr5	6a.4	Using equivalence of fractions (and ratios)	Fractions
Gr6	6a.10	Convert fractions to percentages	Percents.

Silicon Brain

Gr1	2b.2	Find the difference between numbers	Subtract.
Gr2	3e.3	Use a wider range of metric units	Units
Gr4	5b.1	Calculate fractions of quantities	Fractions
Gr3	4d.4	Multiplication and division problems	Division
Gr5	7b.3	Use memory and brackets on calculator	Mult.
Gr 6	8a.1	Standard form (integral powers of 10)	Powers

The Big Bang

Gr1	2a.2	Know and use subtraction facts up to 10	Subtract.
Gr2	3a.3	Know and use addition facts up to 20	Addition
Gr3	5a.3	Multiplication of single-digit powers of 10	Mult.
Gr4	5a.4	Mental division of single-digit powers of 10	Division
Gr5	6a.8	Percentage changes	Percents.
Gr6	6a.9	Convert fractions to decimals	Decimals

Cheers

Gr1	2b.1	Whole number add and subtract problems	Addition
Gr2	3d.2	Make estimates based on familiar units	Estimate.
Gr3	4a.14	Solve multiplication and division problems	Mult.
Gr4	5d.1	Imperial units in daily use	Units
Gr5	5d.4	Use index notation	Powers
Gr6	8b.2	Four rules of fractions	Fractions

English

For Children 6 to 16 Years

Attainment Targets and Levels Covered

Sniper

Gr1: 4.2b.1	Simple monosyllabic words	Spelling
Gr2: 2.2a.1	Read & understand Signs, Labels Notices	Words
Gr3: 3.3a .1	Capital letters full stops and question marks	Punct.
Gr4: 2.7d.1	Retrieve information (Abbreviations etc.)	Lang. use
Gr5: 2.7e.5	Literary devices (Proverbs)	Speech.
Gr6: 3.8c.1	Grammatical constructions (Passive Tense)	Verbs

Grab it

Gr1: 2.2f.1	Read a range of simple material	Speech.
Gr2: 2.2c.2	Phonic cues in reading	Spelling
Gr3: 3.4d.3	Structures of English (Collective nouns)	Nouns
Gr4: 3.6b.2	Use of the the Apostrophe	Punct.
Gr5: 2.7c.3	Choose vocabulary	Lang. use
Gr6: 3.7c.4	Lexical features	Words

Cover Up

Gr1: 2.1b.1	Recognise simple words (adjectives)	Adjectives
Gr2: 2.2e.2	Respond to poems (rhyming words)	Sounds.
Gr3: 3.3e.6	Masculine to feminine nouns	Nouns
Gr4: 4.3c.1	Awareness of word relationships (opposites)	Pairs
Gr5: 4/5.5a	Spell words of greater complexity	Spelling
Gr6: 2.8e.1	Lang. change over time	Lang. Use

Librarian

Gr1: 2.2c.1	Use initial letters to recognise words	Spelling
Gr2: 4.2c.2	Spell a wider range of words (plurals)	Nouns
Gr3: 2.3d.3	Appreciate links between words and sounds	Sounds.
Gr4: 3.4e.2	Revise & redraft writing (descriptive words)	Adjectives
Gr5: 2.7e.2	Use of literary devices – Similes	Speech.
Gr6: 3.7c.4	Choose a wider vocabulary	Pairs

Word Fit

Gr1: 4.2c.1	Spelling patterns (blends)	Words
Gr2: 4.3c.2	Awareness of word relationships (synonyms)	Pairs
Gr3: 3.3a..1	Sentence structure	Verbs
Gr4: 2.5e.3	Awareness of choice of words	Sounds.
Gr5: 2.5e.3	Unconventional spellings	Nouns
Gr6: 4/5.6b	Common misspellings	Spelling

Cheers

Gr1: 3.3e.6	Check for consistent use of comparatives	Adjectives
Gr2: 3.3e.8	Simple use of past tense	Verbs
Gr3: 2.5e.1	Word play	Words
Gr4: 3.5e.1	Use and misuse of colloquialisms	Lang. use
Gr5: 3.7b.2	More complex punctuation	Punct.
Gr6: 3.8c.9	Poetical constructions	Sounds.

Before you buy ANY educational software ASK these questions:

- Is it designed and developed in **BRITAIN** and directly linked to the **NATIONAL CURRICULUM?**
- Has it been designed to use the **POWER** of your 16 or 32-bit computer and not just converted from an existing 8-bit product?
- Does it **MOTIVATE** and **REWARD** the children?
- Is children's progress constantly **MONITORED** and **RECORDED?**
- Can it be **CUSTOMISED** to meet your child's needs?
- Do parents and teachers agree on its **QUALITY?**
- Will it **EDUCATE** your child now but also have sufficient **FLEXIBILITY** to last for several years without the need to purchase the next level?
- Are the producers **CONFIDENT** enough in its quality to let you test it yourself **FREE** – at home or in school?
- Does it **CHALLENGE** more able students but also have levels for beginners?
- Are there **CLEAR** and **OBVIOUS** educational objectives?

If any answer is no, it's not 10 out of 10!

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QUICK ON THE DRAW

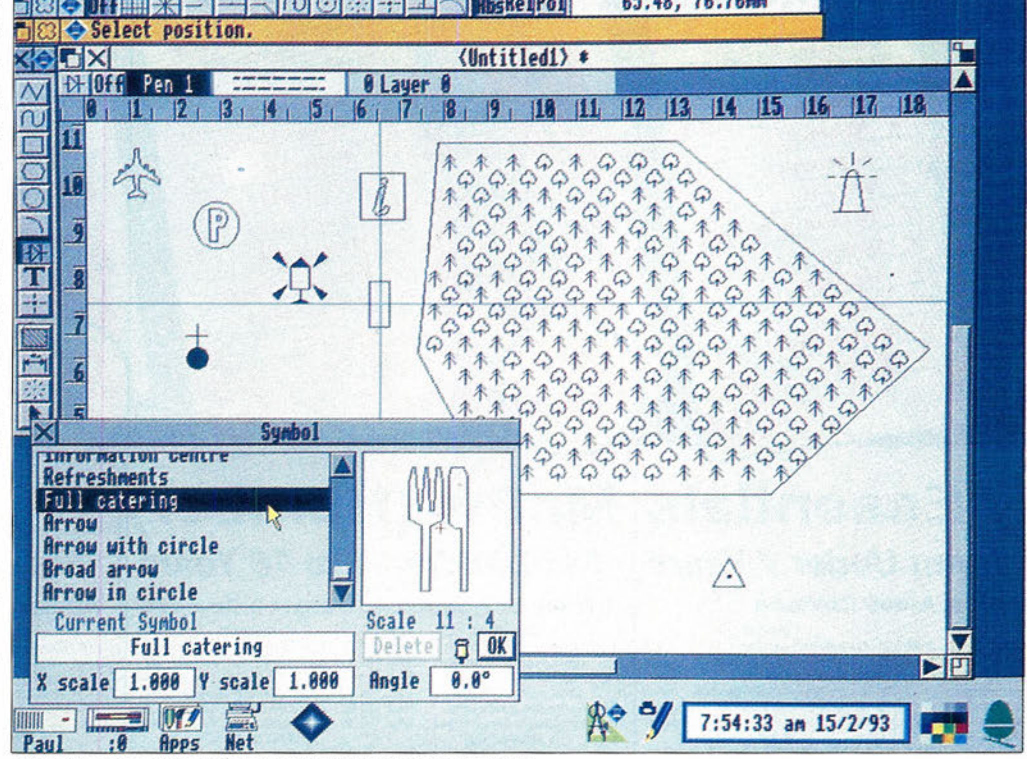
Paul James looks at CADet, Minerva's latest venture into computer-aided design

Draughting is a slow process and *CADet* offers some apparently useful tools to help make an accurate and easy to follow drawing. After all, the result of a draught is often made into a three-dimensional object.

Draughting basically consists of joining two points together with a line. Finding where these two points exist on the paper is what takes the most time, and involves the most knowledge. For instance, finding the centre point of a line calls for some deft manoeuvring with a pair of compasses.

With *CADet*, all you do is turn on the centre of line snap, and when the cursor passes within the proximity of the centre, a snapping sound is made and you know then that anything that you draw will radiate from that point.

In fact the snapping tools are *CADet*'s best feature, and drawings can quickly be built up without worrying about measurements or a grid at all.



CADet is well-equipped for drawing Ordnance Survey maps

LAYING IT OUT

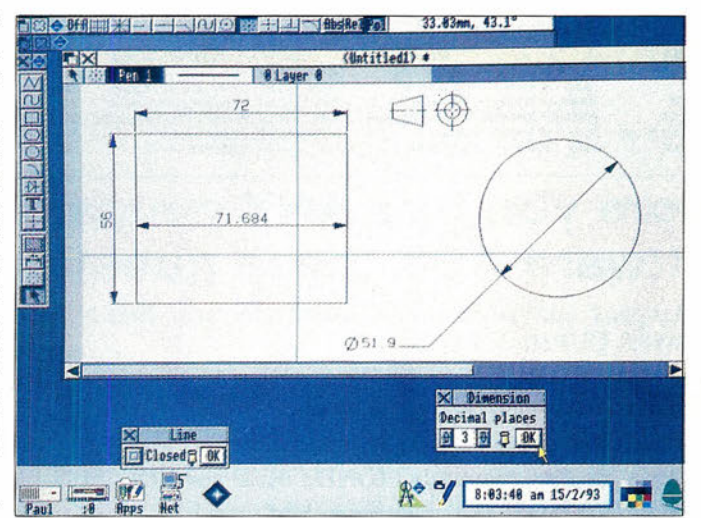
CADet's main window can be surrounded by several 'bars'. The Tool bar is similar to the one in *Draw*. The usual tools are on there, and a few others are glued on to offer further features. For instance, there is a polygon tool that allows polygons of a definable number of sides to be created. If the way a tool operates is definable, then there is a further menu, accessed by clicking Adjust over its icon.

The Snaps bar quickly allows you to define the snapping options. Co-ordinates can be displayed in three formats. Absolute Format displays the co-ordinates of the cursor as though you measured the position of your pencil from the corner of your paper.

Relative format measures from the last position of the cursor when a mouse button was clicked. Third, and most useful, are polar co-ordinates, which measure the distance and angle from the last point.

Inside the actual drawing window you are shown the current tool in use, the current style of line you are drawing with, the pen colour and which layer of the picture you are working on. Layers can be hidden, and made inactive so, for instance, if you had a standard shape like a room then all the objects in the room can exist as other objects, and can be moved around the room shape without effecting it.

The Preference menu contains many things. For instance, you can choose to auto-save your drawing into a specified directory, you can specify which units *CADet* works in, or choose whether a snapping sound is made when a snap occurs.



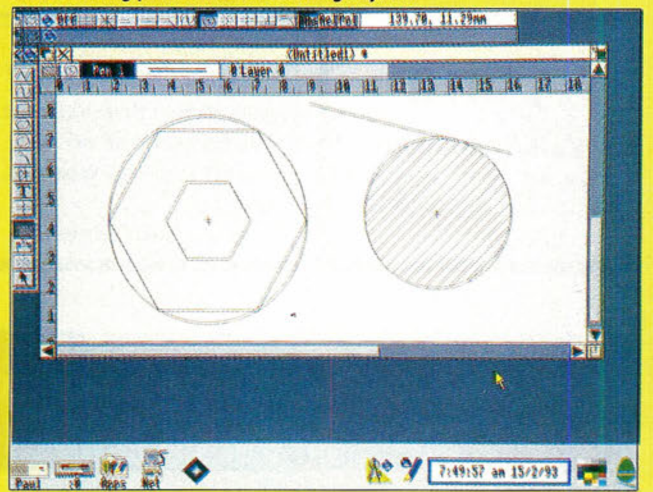
Most dimensioning is easy with *CADet*. In the example above, I plotted the measurements of both sides of the rectangle. Then I picked the first point, the second point, and defined where the dimension line rests. However, to get angled dimension lines, you have to rotate horizontal or vertical ones

A path is made up of a series of lines. If you've used *Draw*, you will know what I mean. However, for some reason, *CADet*'s path creating function is not even as flexible as *Draw*'s, you can't draw a straight line, and then carry on the path with a curved line and then swap back to straight line segments, which is at times very constricting. In fact, if you try this, then you lose the path and have to start over again. The ability to draw

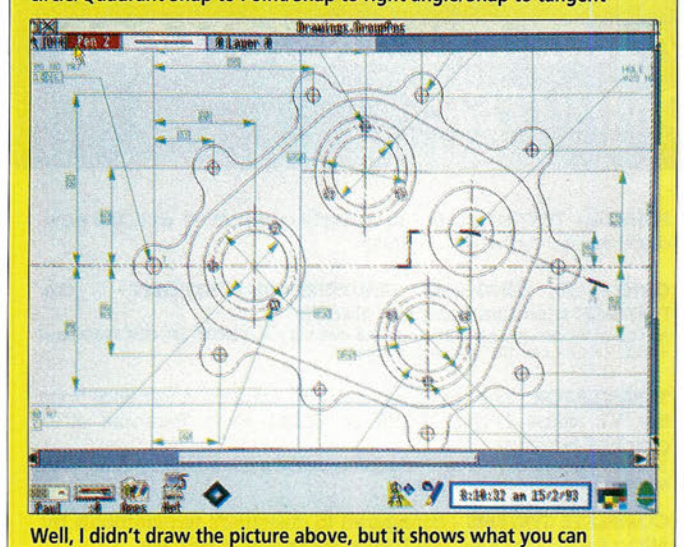
SNAP TO IT

Snaps are undoubtedly *CADet*'s most powerful feature, and drawings can quickly be built up simply by relying on the relationship between one line and another. I've drawn a representation, shown below, of a nut by drawing two hexagons snapped around a centre point, and next to it I've drawn a line at a tangent to the circle by using the tangent snap. These are elements of a drawing that would have taken about five minutes to construct on paper with a pair of compasses and a ruler, but using *CADet* it took me 10 seconds.

While creating paths, snapping to a grid is controlled from the Snap bar, as is snapping to orthogonals. The orthogonal snap is most useful and, when this is on, the cursor will snap to right angles and 45-degree angles relative to the last point in the path. All other snaps will work while creating paths and manoeuvring objects.



Need simple shapes? Here's the snap list for the shot above: Snap to grid/Snap to Orthogonal Grid/Snap to end of path/Snap to middle of line/Snap to line join/Snap to curve join/Snap to circle centre/Snap to circle/Quadrant Snap to Point/Snap to right angle/Snap to tangent



Well, I didn't draw the picture above, but it shows what you can achieve when you really get into snapping

paths with fillets goes some way to helping with this quirk. In *Draw*, you can finish a path in one of two ways, double clicking with Select or clicking with Adjust. So why does *CADet* only offer the first option? Once a path has been drawn, then there is no way of going back and continuing it. The only way to do this is to add new control points to the last line segment.

Curve creation is as basic as that of Risc OS 2 *Draw*, with no facility to flatten a curve or add control points to a curve element without altering the way the curve looks. Since path creation is a major aspect of drawing with a package such as this, I feel it has not been given enough thought while writing *CADet*.

One rather good way of entering paths is to type the co-ordinates directly into the co-ordinates box on the snap bar. For instance, to draw a square using polar co-ordinates, you type 10cm 0 degrees, 10cm 90 degrees, 10cm 270 degrees. Unfortunately, there is no way to specify the end of a path in this way, so you have to place the last point with the mouse.

I liked the Arc creation tool, which when combined with Snaps makes creating an arc easy. Cross-points can also be added by choosing the Point tool and clicking.

Polygons of up to 50 sides can be easily drawn and, in common with other objects in *CADet,* they can be drawn in several different ways, depending on which one suits the current snap. For instance, a rectangle object can be drawn around its centre point, or one of its corners.

So, if you wanted to draw two rectangles with the same centre point, you would set the rectangle tool to draw from the centre vertex and use snap to centre of object.

BEING SELECTIVE

Once an object is created you are probably going to want to move it around, group it with other objects, and move the groups around.

All objects in *CADet* are moved by reference points, the positions of which are defined when Group is chosen from the menu. Objects are added to the selection by clicking Adjust, as in *Draw*. But, unlike *Draw,* a selection of objects can't be moved until they are grouped together.

Grabbing hold of certain objects is quite tricky and, again unlike *Draw,* when you've selected an object you can't simply re-size it or rotate it by tweaking the ears on the bounding box, because there aren't any. Objects can only be rotated and scaled by the transform dialogue box.

Symbols form a large part of draughting. Common symbols that are often added to drawings include the centre line symbol and the diameter symbol. These symbols are included as part of a symbol library supplied with *CADet* (others include OS map and electronics circuit symbols). These libraries are loaded into *CADet*, and then any symbol can be chosen and placed on the drawing, at any scale or angle. Elements of your own drawings can also be made into symbols and saved as part of a symbol library.

Text in *CADet* is not plotted in the normal Risc OS outline fonts, but it matches plotter fonts. Write your words and then you can place them anywhere on the page by clicking Select. Styles can be chosen, as can the size of the text, from the Style submenu.

Objects can be selected and given an area fill. The most common type of fill in draughting is the crosshatch, and this is at the top of the list in *CADet*. The angle of the hatching can be specified, as can the density. When the area fill is chosen, *CADet* creates the fill as another object which exists inside the object filled; if you alter the shape of that object afterwards, then you'll have to delete the fill and re-fill the shape.

PASSING OUT

CADet is a strange package. Some things it does very well, but it is often quirky, which can lead to confusion and frustration. It seems very sound and didn't crash for the period of the review. The whole package has been designed to output in Hewlett Packard graphics language, so I can't see any problems with plotters.

CADet basically restricts itself to offering the bare minimum of tools you'll need to draught a drawing. Isometric design is limited; there is no way to draw isometric curves or circles, for instance.

It is well equipped to draw maps, with an OS symbol library, and flood fills that offer a good range of other standard symbols, and I imagine it will prove useful in many educational areas.

PRODUCT DETAILS

Product: CADet
Supplier: Minerva Software, Minerva House, Baring Crescent, Exeter EX1 1TL
Tel: (0392) 437756
Price: £149+VAT

IN BRIEF

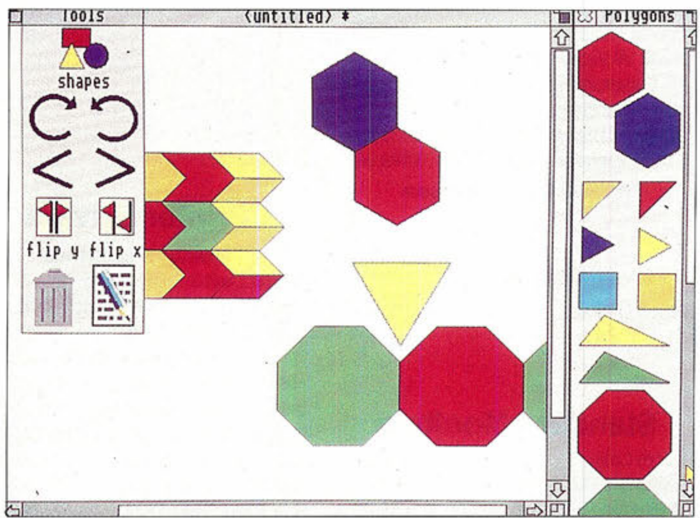
Swift looks at My World 2, NW Semerc's special-needs art program, and Symphony, the latest approach to music sequencing

MY WORLD 2

Northwest Semerc
Tel: 061-627 4469
Price: £28.95 (£2.50 p&p)

Most teachers of young children and those with special educational needs are already using *My World* from Northwest Semerc. The software is a 'fuzzy felt' concept, allowing children to place shapes on a board, move them around and place text alongside them. To help users with motor difficulties the felt is moved by two clicks, not a dragging process.

The package has become widely used since it allows users to create their own packs of 'felt' pieces and screens to support various areas of the curriclum. With *My World 2* it is now possible to have sets of 'felt' pieces held under one button, in order to give pupils more variety of pieces without cluttering up the screen, These are accessed by clicking to get the library window on screen and two clicks to choose and place items as before. Sizing and rotating items is also allowed by use of extra icons on the screen, and grid lock is available to allow for accurate placing by children with poor motor control. This version also allows more than one screen to tell different parts of the story.



My World allows children to build up pictures from 'felt' shapes

The old curriculum packs work with this new version of *My World* but, as yet, the facility for making up a new disc containing the software and screens has not been upgraded, so teachers will need to have some understanding of screen windows and file transfer to make these screens work. Hopefully this will not prevent anyone working to produce screens, since it is that work that makes this package such a powerful tool.

Clare Johnson

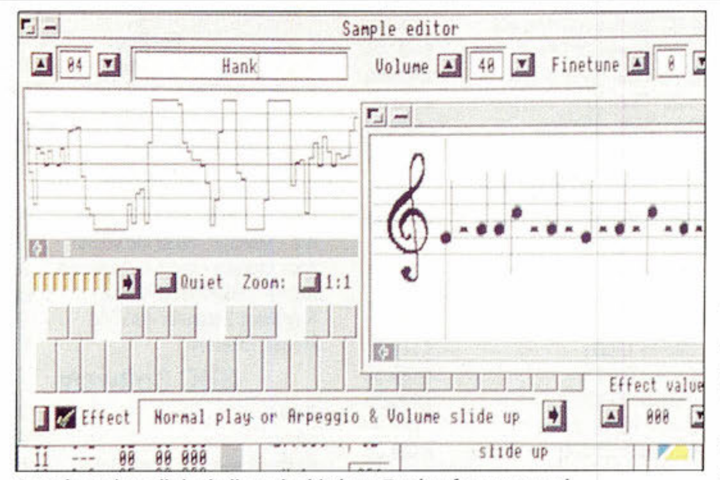
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They're back . . . A few months ago *BAU* told you about the doings of the 'mysterious *Tracker* cult', individuals who create music for the Arc's internal sound in a format derived from the Amiga's *SoundTracker*. *SoundTracker* output bears more similarity to assembly code than to standard musical notation, but aficionados seem to like it that way. The main attraction is that the format generates quite small files and there are numerous uncopyrighted playback modules. Given this and the number of *SoundTracker* tunes and samples in the public domain, *SoundTracker* files have become an almost 'standard' way to incorporate tunes into Arc programs, particularly games. And, the cult is growing with an increasing number of '*SoundTrack* Editors' on the market of which *Digital Symphony* is the latest.

The first thing that struck me about *Symphony* was that, once installed, very little happened. I mean, it played a tune, but where were the windows full of bobbing VU-meters, oscilloscope displays and scrolling columns of figures? Careful investigation however, revealed more windows than I could shake a fist at. I also found the Monitor option that exchanges the desktop for a full-screen display of the track.

Oregan's approach to editing is unusual. Rather than edit events on several sound channels simultaneously, *Symphony* edits a single group of 64 events on one channel at a time. This means that space which might be taken up by other channels is used to give information about samples and sound fx in current use. Patterns are released from a pattern list and the tune is arranged by placing patterns in a sequence editor.



Symphony has all the bells and whistles a Tracker fan may need

Symphony's two most striking features are the rudimentary 'score' display, which shows the current pattern as musical notes and the inbuilt 'Sound Sample Editing Suite'. This allows you to load up a sample, cut it, loop it and play it back from a piano-style keyboard on screen.

It would be impossible to look at this program and not make comparisons with *DeskTop Tracker*. They both accept a wide range of file and sample formats, both allow Midi input and both come with playback 'freeware'. DTT has its sixteen channel multiplexing and *Symphony* its sample editing and 100% compatibility with *SoundTracker*. Which one you choose is very much a matter of taste. To try out *Symphony*, send a disc and sae to Oregan, and the company will send you a demo version.

Richard Garrett


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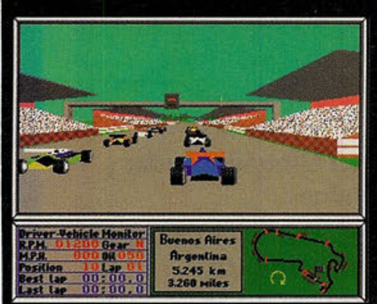

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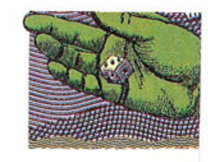
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GAME SHOW

At last, the New Year lull has died away in the games market and things are beginning to hot up for the spring.

In June, Krisalis Software will be releasing two games: a conversion of the Viking role-playing game that has been a hit on 16-bit machines, *Heimdall*, as revealed last month, and a brand new one from Krisalis' own label called *Soccer Kid*.

That's right, it won't be long until the next World Cup, even though it seems like only yesterday that Gazza bawled his eyes out at the last one, bless him. Billed as a 'cutesie platform game', *Soccer Kid* has been in development for 18 months and features the adventures of the cute Kid and his football.

The Kid has a mission. The Cup itself has broken into six pieces, all of which have been nicked by supporters of various nationalities and taken home, meaning the Soccer Kid has to breeze through six countries to build up the Cup and present it to the 1994 World Cup winners in the USA. And that's where the problems start.

In England, the amicable Kid faces trouble from the Great British Rugby Hooligan and, in America, the equivalent; a beefy, brainless American football player who doesn't like soccer kids.

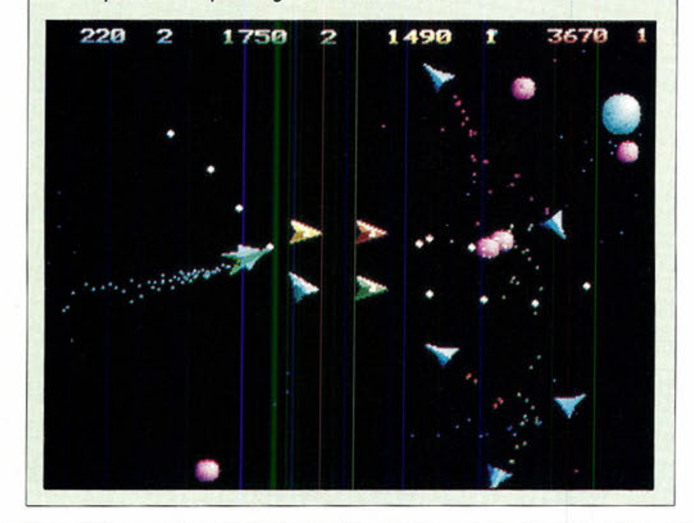
Maniac Italian opera singers, big fat Japanese Sumo wrestlers and even a Brazilian monkey play their part in stopping him at other corners of the globe. (It was going to be a gorilla until somebody pointed out that there are no gorillas in Brazil. 'It is a very big monkey though,' explained the man from Krisalis.)

Soccer Kid is being written by Shaun Hollingworth, the author of *Pacmania*, *Swiv* and *Mad Professor Mariarti*.

Sam Greenhill

CHEATS OF CHAOS

Here's a handy tip for *Spheres of Chaos* addicts, the asteroids shoot-em-up from Matt Black Software. Liam Corner from Rugby in Warwickshire has written to point out that your firepower can be greatly enhanced by choosing four-player mode and redefining the keys for all players to the same, or alternatively making all four players controlled by the mouse. Bingo! Four ships on screen, whack the fire button and 'don't look now, Mr. Asteroid, but you're about to eat a quadruple stream of lead!'. The only trouble is, it isn't easy to fly around because the ships aren't all pointing in the same direction!



THE HACKER

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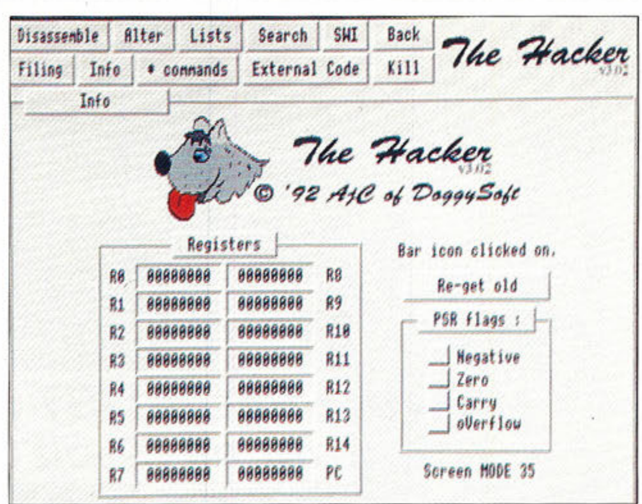
An alternative to *Games Wizard*, the versatile cheating utility reviewed last month, has been released by a firm called DoggySoft. *The Hacker* works in much the same way as *Wizard*, by sneaking its way through the internal workings of a game and rooting out the places in memory where numbers such as 'lives' are stored.

Once that's discovered, any number can be typed in its place to obtain plenty of lives, or, for that matter, extra time, enhanced firepower, loadsa money and even new passwords.

Of the two, *The Hacker* looks a lot sprucer with its 3D icons and trendy control panels and it is operated by using the mouse, unlike the keyboard menu system employed in *Wizard*. This makes life a lot easier when it comes to running the gauntlet of scanning through memory in search of lives.

Another brownie point for *Hacker* is in the final 'packaging' of cheats. Once you've used a cheating utility to discover which part of the computer's memory you need to alter to get more lives, you want to be able to activate the cheats easily and quickly from the game.

With *Games Wizard*, there is no immediately simple way to do it: you have to pause the game to go into the utility, then 'poke' the lives address in memory with the new value. This process is available as a special script file from the publisher that does all the poking automatically at the press of a hot-key combination. But, with *The Hacker,* this process is included in the software.



The Hacker turns the most difficult of games into your lapdog

The final score? *The Hacker* is is by far the most slick, yet it is *Games Wizard* that comes from the professional publisher, Micropower. Both utilities do the same job but *The Hacker* does a bit more, is also easier to use and only costs a fiver. The problem is the manual, which, clearly, is written by somebody who finds technical jargon interesting.

Maurice Truman

BATTLE CHESS

Krisalis
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Battle Chess puts the war back in wargaming

Isn't chess boring? I mean, you sit there, for hours on end, staring hard at a boring two-colour board which has lots of boring pieces that stand perfectly still in the most boring of postures.

The answer? Give each piece a bit of personality, a sense of humour and some in-built vengeance. This is what *Battle Chess* is all about. The board appears fairly normal. But when you decide to move a piece using the mouse, it walks to its new position.

The knights stride, the aging king shuffles and a very elegant queen looks like she's slinking along a catwalk. But the real fun starts when you try to take a piece.

With pawns, we're talking about a straightforward 'baton' fight which lasts for about 10 seconds, but set the knights on each other and the battle gets a bit more meaty and a lot more gory.

In a scene lifted right out of Monty Python's *Holy Grail*, the knight's right arm is lopped clean off and lands on the floor. He pauses to ponder this, then continues the fight. Lop. Off goes the other arm. Then, while trying to kick his opponent to death, his leg gets the chop. And so on until he is no more . . .

Perhaps the funniest is when a pawn gets taken by a piece twice his size. The bishop – who behaves remarkably like a ninja turtle – snaps the pawn's baton in half, leaving him defenceless; hefty knights just pulverise him, and the king smashes the little pawn's baton away with a big golden mace.

Battle Chess can be played by one, two or zero players and it is possible to edit the board, take back moves and all the standard things expected of a computer chess game. It can also be played in two dimensions but after a while I found the 3D board easy to play on. My only quibble is that each animated move takes ages to load if you only have a floppy disc and there's nothing more boring than staring at a boring board for hours on end, waiting for something to happen . . .

Sam Greenhill

DRAGONBALL

TBA Software
24 Eastgate St., Aberystwyth, Wales SY23 2AR.
32-bit machines
£14.99

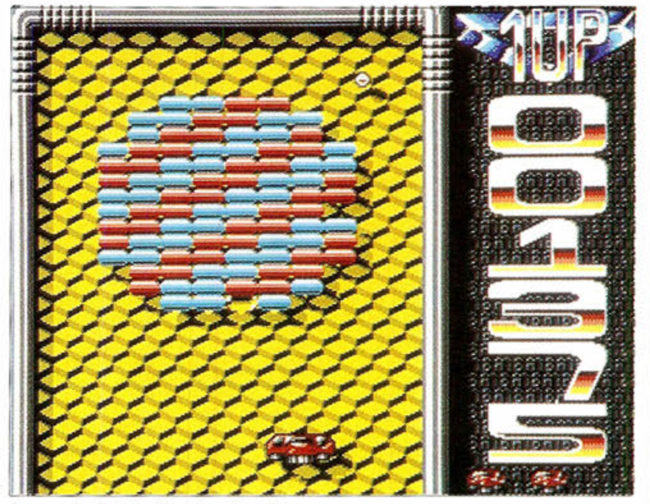
Oh dear, I said, when I first realised what this game was. *Breakout*, *Arkanoid*, *Impact*, *Fireball* . . . the list of bat 'n' ball clones preceding this one is seemingly endless, and for another one to squeeze itself on the scene, it had better be pretty good . . .

The scenario is straightforward enough: bat, ball, bunch of bricks and an arena slightly smaller than the size of the screen. The objective is to clear the screen of bricks by knocking them out with the ball; there are 100 different arrangements of bricks.

Dragonball is the first game from TBA Software, which admits the game is not too original but claims, 'we have brought it right into the 90s with good graphics, great music, nice sounds and fantastic gameplay.'

There are bonus bricks that send down little power-ups such as the ability to catch and hold the ball, ones that multiply the number of balls on screen and 'bomb' crystals that wipe out the whole set of bricks in an instant. There are even a few pinball-style bumpers that award 50 points whenever they are hit.

But all this is in vain. *Dragonball*'s graphics are garish to say the least, painful at worst, and sound is limited to a few twangs and beeps. The ball flies off sideways if hit by the edge of the bat and zooms straight up when hit dead on, but the problem is that there appear to be very few positions in between.



Dragonball: it's all rather familiar

To a newcomer, *Dragonball* is probably a great deal of fun and provides some good entertainment. This is because, in spite of its shortcomings, it takes an addictive formula and puts it into practice reasonably well.

I've seen better and that better is still available, so why should I settle for less? *Fireball 2*, from CIS, is a highly polished bat 'n' ball game with no significant faults that looks good, feels good and plays well too. It even comes with a screen designer.

So where does that leave *Dragonball*? In the budget box, is one answer. *Dragonball* only costs £14.99 and that *is* good value for a game of reasonable quality.

Josef Koestler


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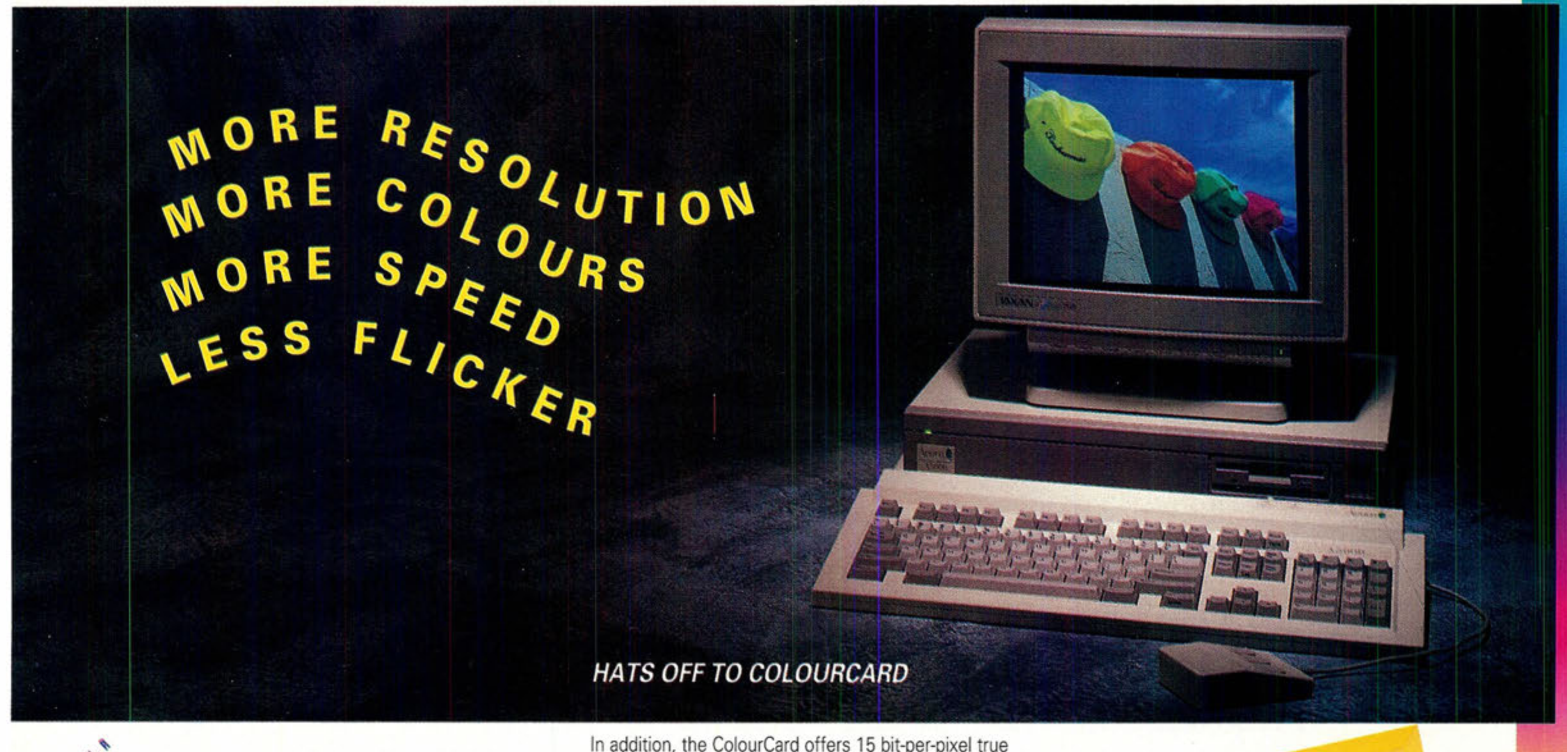
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THE ColourCard

FOR THE ARCHIMEDES



HATS OFF TO COLOURCARD



A new graphics accelerator card for the Archimedes, the ColourCard brings a host of improvements to the video capabilities of any Archimedes A300*, 400*, 540 or 5000 series computer.

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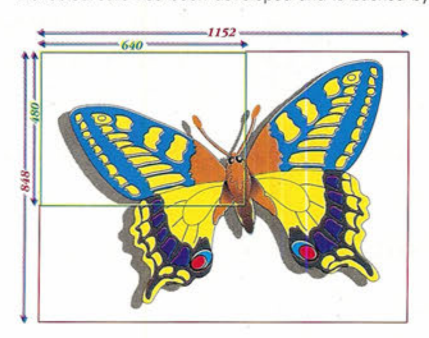
In 16 and 256 colour screen modes all the colours are selectable from 16 million hues. This means scanned pictures can be seen with 256 true grey-levels on screen and that you are no longer restricted to the preset Acorn palette. Some applications, such as ArtWorks, can provide better screen colouring using the new palettes.

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QUESTIONS AND ANSWERS

Q I am thinking of buying either an A3020 – with hard disc – or an A4000.

Which is better for home use? I am interested in playing games, programming in Basic and assembler, sound sampling, using art packages, DTP and so on.

A. Martin
Cardiff

A Differences between the baseline A4000 and the A3020HD are all fairly minor. The A4000 has an 80Mb hard disc rather than the 60Mb on the 3020, comes with a remote keyboard and costs fifty quid more.

It's probably healthier to sit as far away from the screen as you can and you can never have enough hard disc space, so I reckon this is £50 well spent. If you're planning to get seriously into memory intensive applications like DTP and art, I would recommend that you install the full 4Mb of Ram. If you do this when you buy the computer, your dealer may agree to throw in the upgrade for a cheaper price.

Q I recently purchased an A3000, but for five years I have been working on an Acorn Electron, so I have a large amount of software on tape that I would like to transfer to disc for my new machine.

Is there any way to do this? The *TAPE command is useable, but there is no tape socket available.

Ben Gibbard
Bridgnorth

A Although the 6502 emulator provides the *TAPE command, this is only there for consistency with the original BBC B operating system and doesn't actually do any of the file handling itself.

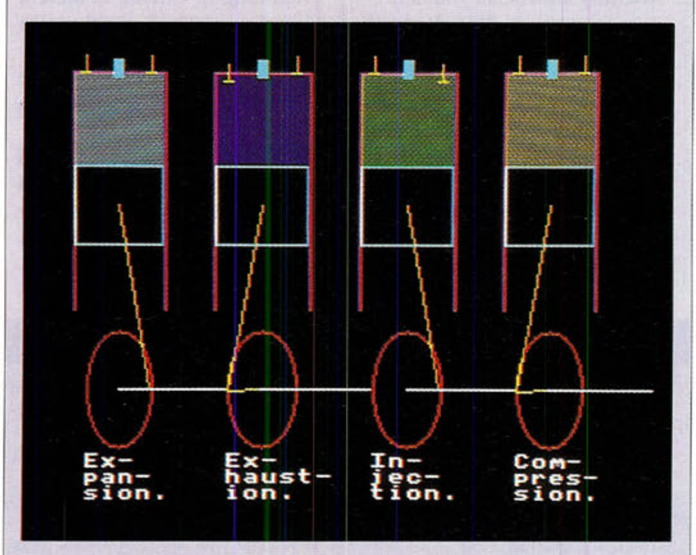
The reason for this is that many early Beeb programmers used *TAPE as a cute way of liberating a couple of K of storage from the DFS while the disc drive wasn't doing anything.

What you need is to locate someone with a Master and 3.5in disc drive who can help you to transfer your files over to your new machine. Perhaps a school or computer club in your area could help you out.

STAR QUESTION

Q I would like to buy some software that displays the workings of two and four stroke petrol and diesel engines but haven't been able to find anything. The Archimedes must be capable of superlative demonstration accompanied by realistic sounds: the Nevyron game already displays convincing cut-away views of pistons moving in cylinders. Could you point out something suitable?

A.H. Evans
Leeds



A The only commercial package I know of is sold by AVP, tel: (0291) 625439, called the *The Four-Stroke Engine*. This is available for all Acorn computers and includes animation of a single cylinder four-stroke cycle. It also features a model of a four-cylinder, in-line, overhead camshaft engine that allows users to see what's happening in all four cylinders at once. These illustrations demonstrate the principles clearly but are obviously derived from an earlier BBC version of the software, and do not make full use of the Archimedes' graphic or sound capabilities.

A simple program along these lines is *Motor* (shown above), featured on our £7.95 *INFO compilation disc. Call (0937) 842489 for more details.

Q I am using a 4Mb A420/1 with Risc OS 3 on which I create *Impression* documents of up to 15 pages containing a lot of graphics, mostly from *Draw*. Printing these to dot matrix takes an average of five to six minutes per page, and on a Hewlett Packard Laserjet 2 about four minutes per page, but my problem is the time taken to compose the document.

Printing such a document to file first is of no great advantage, as it still takes a very long time to compose the pages and I cannot use my computer while this is going on. I also have to set the printer driver to print to file and then reset it to send the output file to the printer; a step I usually forget. The time saved, if any, is not worth the bother. In any case, longer documents would require too much memory to print to file.

What I really want is a printer driver that composes a page at a time and then sends it to the printer; all in background. Do such drivers exist and do they make everything run unbearably slowly? Would an external printer buffer help and how big would it have to be? Should I fit an Arm3 chip?

John Martin
Accra

A There are two processes at work here. In the first, called 'composition', the DTP program analyses the objects laid out on its pages and converts the resulting graphical image into codes that can be understood by the printer driver.

In the second, 'printing', the program directs that stream of bits to the printer driver which modifies the codes to suit your printer, and then sends them.

Composition is internal to the DTP program and no printer driver on earth will change it. It is a long process, but turning many text and graphics objects into a stream of several hundred dots per inch, accurate to better than a millimetre, consumes rather a lot of processor time.

Commercial Unix-based publishing systems do have the power to 'compose in background' but nothing on the Arc has this capability. To speed up this part of the proceedings you will need to install an Arm3.

When printing, the program talks to the outside world and how fast it does this depends on what it's talking to. In 'background printing', the data is first 'spooled' to a file in Ram disc. The simple matter of moving data from one chunk of memory to another eliminates waiting for the physical operation of the printer.

Once the output file has been created and dropped on to the printer driver icon,

actual printing takes place without depriving you of control. 'Background printing', in effect, turns some of your Arc's memory into an 'internal' printer buffer.

Some time is added by switching the driver between disc and printer but, compared to the time taken to print at 200 or more dots per inch on a dot-matrix, I'm surprised you find it 'of no great advantage'.

External buffering would speed things up initially by cutting out the time taken saving and switching the printer driver but, unless the buffer is as big is your typical output file, it will soon fill up, so causing a bottleneck later on.

Given the size of file that you use, an external buffer for your dot matrix printer would be very expensive. At £50 per Mb, however, it may serve you better to buy some more Ram for your Laserjet.



ESM's Rom can cope with nine-pin colour or the Integrex Colourjet shown

Q I have a BBC Master with a Star LC-200 nine-pin colour printer, and would like to get hold of a printer dump program that will output the screen's contents in colour. I made an attempt at writing a Mode 2 colour dump, but it's woefully slow. Can you help?

Dan Jackson
Peterlee

A **Try the Colour Screenprint Rom from ESM; (0223) 65445. This comes in three versions, one for nine-pin colour like the LC200; one for 24-pin printers; and one for inkjets like the Integrex Colourjet.**

Q I am doing a computing course that involves programming in Comal. Is there a Comal compiler I could use to work on my A3000 at home?

Andrew Gillespie
Dumbarton

A **I don't know of a Comal compiler that runs in the 'native' Risc OS environment, but there is a PC product called *UniCOMAL* that will run under DOS emulation. The distributor is MacharSoft: (0671) 3441.**

UPDATE

OK, mea culpa; I did it! In February's *BAU*, I answered a question about transferring graphics files between PCs and the Arc. I recommended John Kortink's excellent shareware packages for converting sprites to and from Tiff and Giff formats. I then said I didn't know of a program that would do the same job for Windows .BMP files.

As soon as the issue hit the newsstands, I started getting letters telling me that recent versions of *Translator* and *Creator* do, in fact, handle Windows bitmaps. My apologies to John for not being more up to date on his program and my thanks to Geoff Arnold of Tadworth and Graham Hick of Oxford for gently pointing this out. *Translator* and *Creator* are available from most public domain distributors.

Thanks also to readers who wrote in with help and manuals on the Panos 32016 operating system for I. Barr (January Q&A). Your letters have been sent on.

CUSTOMER HOT LINE

Every month in BAU, Alan Glover from the Acorn customer service department offers you Acorn's advice and support

HOTLINE: RISC OS 3

This month we concentrate on Risc OS 3, and on some of the problems that may be experienced when upgrading from Risc OS 2 (or using Risc OS 3 and Risc OS 2 in the same environment).

The Release Note supplied with Risc OS 3 contains a number of important hints; please take the time to read it through and note anything applicable to your environment.

POINTS TO REMEMBER WITH DOS PARTITIONS

● When you finish using a floppy disc that contains a DOS partition file, you should dismount the disc before removing it to ensure that any buffered data is written to the disc. This is also a good practice to maintain in normal use, since it will ensure that the computer does not ask for any discs that you have finished with. If buffered data has not been written to the disc it is possible that the file may be corrupted because the last part of the file may still be in the computer's buffer rather than on the disc.

● The setting of the Truncate option can cause unexpected behaviour. If the Truncate option is turned on, and files are being copied from a ten character filename filing system – such as ADFS – to a DOS partition – with eight character filenames and a three character extension – the name will be truncated to eight characters. This can result in the accidental overwriting of files whose first eight characters of the filename are identical.

The alternative is to have the Truncate option turned off, in which case an error will be produced whenever a copy operation which would result in name truncation is attempted.

MORE RISC OS 3 HINTS

● FONTS: The *!Fonts* directory under Risc OS 3 differs from the Risc OS 2 one since it now provides support for multiple font directories and fonts in Rom.

If you wish to transfer fonts from a Risc OS 2 !Fonts directory to a Risc OS 3 one you should open both using SHIFT-Double Click-Select and then copy the individual font directories from the Risc OS 2 one to the Risc OS 3 one.

You do not need to copy the additional files from inside the Risc OS 2 *!Fonts* directory to Risc OS 3 since the Outline Font Manager and associated modules are already provided in the Risc OS 3 Rom. Since Corpus, Homerton and Trinity are already present in the Risc OS 3 Rom there is no need to copy these into a Risc OS 3 *!Fonts* directory.

Should you find that you lose access to the Risc OS 3 Rom fonts – Corpus, Homerton and Trinity – it is likely that you have come into contact with a Risc OS 2 *!Fonts* directory.

● Risc OS 2 and Risc OS 3: In some situations it is common to use a start-up disc to load regularly needed modules, applications and so on. Separate discs should be used for Risc OS 2 and Risc OS 3 systems, since the modules which need to be loaded differ significantly between the two; Risc OS 3 already contains most of the modules which you would need to add to a Risc OS 2 system.

In particular, the *!Fonts* directory on the start-up disc must be the correct one for the version of Risc OS in use.

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ACORN USER ADVERTISEMENT PAGES
APRIL 1993



£15 STAR LETTER

I read with interest the evidence that some branches of Dixons were not particularly enthusiastic about selling the A3010, and thought you might be interested in my experience last Christmas.

I went into a Dixons branch to enquire about Acorn computers, explaining that I wanted to use it for word processing, home accounts, data storage and the production of the kind of graphics possible with *Revelation 2*, and I was directed to the Atari ST.

To be fair, the assistant did say that he was temporarily employed there over the Christmas period, and was himself an owner of the Atari. It may be true that the Atari would do what I wanted, but no attempt was made to state the advantages of the Acorn or to compare the two machines. Only the more expensive PCs were being demonstrated.

I purchased the Atari which appeared to be faulty, so I rang up to be told that it was obviously faulty and I should return it. The fact that no regret was expressed and that the person's telephone manner was less than pleasing that made me exchange it for an Acorn A3010.

I am, of course, very pleased with the Acorn. I am a 60 year old artist who has always had a fear of computers, and the A3010 is my first computer. I have experienced no difficulty in following the instructions and in using the machine. It seems to me to be an ideal computer for those with an innate fear of computing, and it has given me the confidence to delve much deeper into the subject.

H J R Bennett
Lincolnshire

We've had quite a few letters along these lines. Here's a quick guide to preparing yourself for the high street gamble. Ask yourself the following questions:

- **Are you sure you want to buy a computer from a high street store?**
- **Is the price significantly better than other outlets?**
- **Can you cope with almost no backup support?**
- **Are you happy to spend around £500 on something recommended to you by someone who is almost certainly not an Acorn user?**

If you can answer 'yes' to all of the above questions, then go to a high street store. If not, then perhaps you should consider going to a qualified Acorn dealer such as Beebug or Watford.



The A3010: Is it being given the high street push it deserves?

HOW FAST IS FAST?

First of all, congratulations on a fine magazine! Although I do not own an Acorn computer, I have been buying *Acorn User* since June 1992 to learn more about the Acorn Risc family of computers. My interests are in desktop video production (and in multimedia generally) and AI.

I have delayed any decisions about buying a computer until I am convinced that I have made the 'best' choice. At present I work with the Apple Macintosh IIcx, which I believe to be overpriced for its performance.

The Amiga is touted as being the ideal desktop video computer, but until the Amiga 1200 I was not happy about its 16-bit architecture.

My question is (making allowances for Acorn's lack of software): which machine should I invest in? I am attracted by the speed of Acorn's Risc processor, but I note that in an item in December's news (Who's the Fastest?) no mention is made of the advantages in speed derived from the Amiga's custom chips alleviating the work of the main processor. Doing the same video/graphics work, is the Acorn still faster?

Lloyd Evering
London

Speed is very subjective: we could go on quoting mips and clock speeds until the cows come home. There is no doubt that the Archimedes is extremely fast: witness the speed comparisons between redrawing in *ArtWorks* and the PC packages such as *Corel Draw*.

However, the availability of hardware and software is surely a more important issue. Acorn's new Replay DIY package (see our review on page 22) should help to make Acorn more of a contender in the video stakes.

MISPRINTER

On page 111 of the March 1993 issue of Acorn User there is a comparative review of the Hewlett Packard 550C colour printer, which contains the statement that: 'Blacks in a colour image are produced by printing all three colours together. The resulting dark brown is good enough when solid but when a shade of grey is required, the difference is all too obvious.'

I have the HP 550C colour printer with the ProPrinter driver from Ace Computing, and I can assure you that the statement in your magazine is incorrect and that true blacks *are* produced by the HP 550C when printing colour pictures.

George H Foot
Surrey

Our apologies for the oversight. To enable the HP 550C to print in both colour and perfect black, you do however, need a special printer driver, which was not featured in the review.

Printer drivers for the HP550C are available from Ace Computing on (0954) 211760 and Risc Developments on (0727) 840303.



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